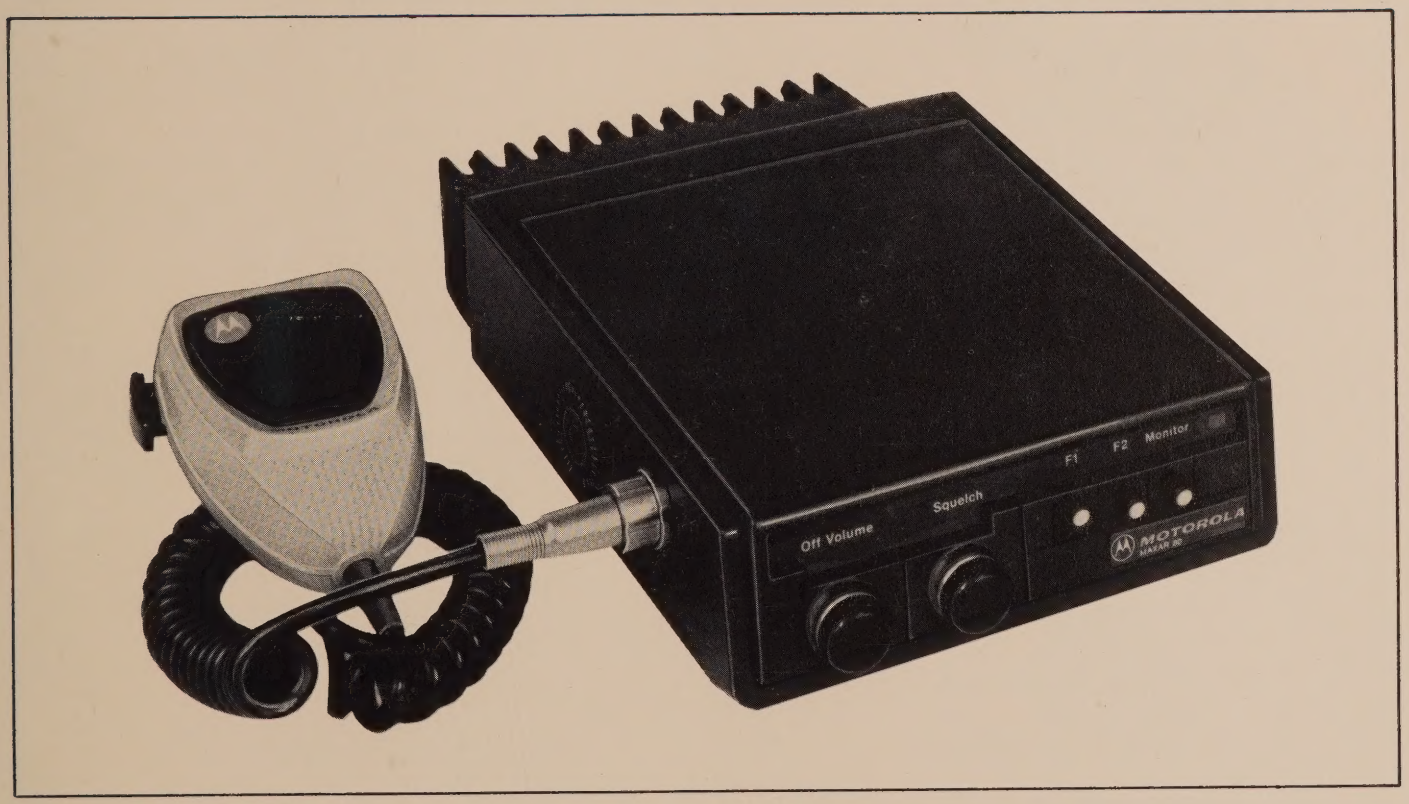
MOTOROLA

MAXAR®-80

Two-Way FM Radio

30 W/25 W RF Power
2 W L.P.I. RF Power
450-512 MHz



Instruction Manual

68P81037E90-D

COMMERCIAL WARRANTY
(STANDARD)

Motorola radio communications products are warranted to be free from defects in material and workmanship for a period of ONE (1) YEAR, (except for crystals and channel elements which are warranted for a period of ten (10) years) from the date of shipment. Parts, including crystals and channel elements, will be replaced free of charge for the full warranty period but the labor to replace defective parts will only be provided for One Hundred-Twenty (120) days from the date of shipment. Thereafter purchaser must pay for the labor involved in repairing the product or replacing the parts at the prevailing rates together with any transportation charges to or from the place where warranty service is provided. This express warranty is extended by Motorola Communications and Electronics, Inc., 1301 E. Algonquin Road, Schaumburg, Illinois 60196, to the original purchaser only, and only to those purchasing for purpose of leasing or solely for commercial, industrial, or governmental use.

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In the event of a defect, malfunction or failure to conform to specifications established by seller, or if appropriate, to specifications accepted by Seller in writing, during the period shown, Motorola, at its option, will either repair or replace the product or refund the purchase price thereof, and such action on the part of Motorola shall be the full extent of Motorola's liability hereunder.

This warranty is void if:

a. the product is used in other than its normal and customary manner;
b. the product has been subject to misuse, accident, neglect or damage;
c. unauthorized alterations or repairs have been made, or unapproved parts used in the equipment.

This warranty extends only to individual products, batteries are excluded, but carry their own separate limited warranty. Because each radio system is unique, Motorola disclaims liability for range, coverage, or operation of the system as a whole under this warranty except by a separate written agreement signed by an officer of Motorola.

Non-Motorola manufactured products are excluded from this warranty, but subject to the warranty provided by their manufacturers, a copy of which will be supplied to you on specific written request.

In order to obtain performance of this warranty, purchaser must contact its Motorola salesperson or Motorola at the address first above shown, attention Quality Assurance Department.

This warranty applies only within the United States.

EPS-27734-O

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EPS-34440-B

68P81112E94-B

MOTOROLA INC.

instruction manual revision

GENERAL

This revision outlines changes that have occurred since the printing of your instruction manual. Use this information to correct your manual.

INSTRUCTION MANUALS AFFECTED:

FLEXAR Stations

68P81035E55	Base Station, 136-512 MHz
68P81045E10	Base/Repeater, 450-512 MHz

MOXY Two-Way FM Radio

68P81043E95	150.8-174 MHz (45 watts)
68P81034E60	450-512 MHz (10 watts)
68P81042E85	450-512 MHz (16 watts)
68P81044E65	450-512 MHz (25/30 watts)
68P81060E55	RCC, 150.8-162 MHz (45 watts)
68P81060E50	RCC, 450-470 MHz (30 watts)

MAXAR Two-Way FM Radio

68P81044E05	150.8-174 MHz (50 watts)
68P81037E05	403-420 MHz (15 watts)
68P81028E75	450-512 MHz (15 watts)
68P81042E80	450-512 MHz (25 watts)

MAXAR-80 Two-Way FM Radio

68P81037E95	136-174 MHz (2/25/50 watts)
68P81044E50	136-174 MHz (85 watts)
68P81037E90	450-512 MHz (2/25/30 watts)
68P81040E25	806-870 MHz (10 watts)
68P81044E70	806-870 MHz (10 watts)
68P81109E22	MAXAR/MAXAR-80/MOXY Speaker/Amplifier (B549 Option)

SMR-4362
1/18/82

ITEMS AFFECTED:

TLD5611A	TLF6321A
TLD5612A	TLF6321B
TLD5613A	TLF6331A
TLE4023A	TRN6653A
TLE4165A	TRN6847A
TLE8691A	TRN8245A
TLE8693A	TRN8389A
TLE8694A	TRN8500A
TLE8695A	TRN8730A

REVISION DETAILS:

All 1/8 watt, carbon composition, fixed resistors used in the previously listed items are replaced with ±5%; 1/8 watt, carbon film, fixed resistors. Use the following cross-reference list to update the parts lists in your manual.

CROSS-REFERENCE LIST: OLD vs NEW RESISTOR PART NUMBER

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (±5%, 1/8 watt)
6-185A01	6-11041C17	10
6-185A02	6-11041C18	11
6-185A03	6-11041C19	12
6-185A04	6-11041C20	13
6-185A05	6-11041C21	15
6-185A06	6-11041C22	16
6-185A07	6-11041C23	18
6-185A08	6-11041C24	20
6-185A09	6-11041C25	22
6-185A10	6-11041C26	24
6-185A11	6-11041C27	27
6-185A12	6-11041C28	30
6-185A13	6-11041C29	33
6-185A14	6-11041C30	36
6-185A15	6-11041C31	39
6-185A16	6-11041C32	43
6-185A17	6-11041C33	47
6-185A18	6-11041C34	51
6-185A19	6-11041C35	56
6-185A20	6-11041C36	62
6-185A21	6-11041C37	68
6-185A22	6-11041C38	75
6-185A23	6-11041C39	82
6-185A24	6-11041C40	91
6-185A25	6-11041C41	100
6-185A26	6-11041C42	110
6-185A27	6-11041C43	120
6-185A28	6-11041C44	130

CROSS-REFERENCE LIST: OLD vs NEW RESISTOR PART NUMBER (Cont.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/8 watt)
6-185A29	6-11041C45	150
6-185A30	6-11041C46	160
6-185A31	6-11041C47	180
6-185A32	6-11041C48	200
6-185A33	6-11041C49	220
6-185A34	6-11041C50	240
6-185A35	6-11041C51	270
6-185A36	6-11041C52	300
6-185C37	6-11041C53	330
6-185C38	6-11041C54	360
6-185C39	6-11041C55	390
6-185C40	6-11041C56	430
6-185C41	6-11041C57	470
6-185C42	6-11041C58	510
6-185C43	6-11041C59	560
6-185A44	6-11041C60	620
6-185A45	6-11041C61	680
6-185A46	6-11041C62	750
6-185A47	6-11041C63	820
6-185A48	6-11041C64	910
6-185A49	6-11041C65	1k
6-185A50	6-11041C66	1.1k
6-185A51	6-11041C67	1.2k
6-185A52	6-11041C68	1.3k
6-185A53	6-11041C69	1.5k
6-185A54	6-11041C70	1.6k
6-185A55	6-11041C71	1.8k
6-185A56	6-11041C72	2k
6-185A57	6-11041C73	2.2k
6-185A58	6-11041C74	2.4k
6-185A59	6-11041C75	2.7k
6-185A60	6-11041C76	3k
6-185A61	6-11041C77	3.3k
6-185A62	6-11041C78	3.6k
6-185A63	6-11041C79	3.9k
6-185A64	6-11041C80	4.3k
6-185A65	6-11041C81	4.7k
6-185A66	6-11041C82	5.1k
6-185A67	6-11041C83	5.6k
6-185A68	6-11041C84	6.2k
6-185A69	6-11041C85	6.8k
6-185A70	6-11041C86	7.5k
6-185A71	6-11041C87	8.2k
6-185A72	6-11041C88	9.1k
6-185A73	6-11041C89	10k
6-185A74	6-11041C90	11k
6-185A75	6-11041C91	12k
6-185A76	6-11041C92	13k
6-185A77	6-11041C93	15k

CROSS-REFERENCE LIST: OLD vs NEW RESISTOR PART NUMBER (Cont.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/8 watt)
6-185A78	6-11041C94	16k
6-185A79	6-11041C95	18k
6-185A80	6-11041C96	20k
6-185A81	6-11041C97	22k
6-185A82	6-11041C98	24k
6-185A83	6-11041C99	27k
6-185A84	6-11041D01	30k
6-185A85	6-11041B02	33k
6-185A86	6-11041B03	36k
6-185A87	6-11041B04	39k
6-185A88	6-11041B05	43k
6-185A89	6-11041B06	47k
6-185A90	6-11041B07	51k
6-185A91	6-11041B08	56k
6-185A92	6-11041B09	62k
6-185A93	6-11041B10	68k
6-185A94	6-11041B11	75k
6-185A95	6-11041B12	82k
6-185A96	6-11041B13	91k
6-185A97	6-11041B14	100k
6-185A98	6-11041B15	110k
6-185A99	6-11041B16	120k
6-185B01	6-11041B17	130k
6-185B02	6-11041B18	150k
6-185B03	6-11041B19	160k
6-185B04	6-11041B20	180k
6-185B05	6-11041B21	200k
6-185B06	6-11041B22	220k
6-185B07	6-11041B23	240k
6-185B08	6-11041B24	270k
6-185B09	6-11041B25	300k
6-185B10	6-11041B26	330k
6-185B11	6-11041B27	360k
6-185B12	6-11041B28	390k
6-185B13	6-11041B29	430k
6-185B14	6-11041B30	470k
6-185B15	6-11041B31	510k
6-185B16	6-11041B32	560k
6-185B17	6-11041B33	620k
6-185B18	6-11041B34	680k
6-185B19	6-11041B35	750k
6-185B20	6-11041B36	820k
6-185B21	6-11041B37	910k
6-185B22	6-11041B38	1 meg
6-185B55	6-11041C17	10
6-185B56	6-11041C19	12
6-185B57	6-11041C21	15
6-185B58	6-11041C23	18
6-185B59	6-11041C25	22

CROSS-REFERENCE LIST: OLD vs NEW RESISTOR PART NUMBER (Cont.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/8 watt)
6-185B60	6-11041C27	27
6-185B61	6-11041C29	33
6-185B62	6-11041C31	39
6-185B63	6-11041C33	47
6-185B64	6-11041C35	56
6-185B65	6-11041C37	68
6-185B66	6-11041C39	82
6-185B67	6-11041C41	100
6-185B68	6-11041C43	120
6-185B69	6-11041C45	150
6-185B70	6-11041C47	180
6-185B71	6-11041C49	220
6-185B72	6-11041C51	270
6-185B73	6-11041C53	330
6-185B74	6-11041C55	390
6-185B75	6-11041C57	470
6-185B76	6-11041C59	560
6-185B77	6-11041C61	680
6-185B78	6-11041C63	820
6-185B79	6-11041C65	1k
6-185B80	6-11041C67	1.2k
6-185B81	6-11041C69	1.5k
6-185B82	6-11041C71	1.8k
6-185B83	6-11041C73	2.2k
6-185B84	6-11041C75	2.7k
6-185B85	6-11041C77	3.3k
6-185B86	6-11041C79	3.9k
6-185B87	6-11041C81	4.7k
6-185B88	6-11041C83	5.6k
6-185B89	6-11041C85	6.8k
6-185B90	6-11041C87	8.2k
6-185B91	6-11041C89	10k
6-185B92	6-11041C91	12k
6-185B93	6-11041C93	15k
6-185B94	6-11041C95	18k
6-185B95	6-11041C97	22k
6-185B96	6-11041C99	27k
6-185B97	6-11041B02	33k
6-185B98	6-11041B04	39k
6-185B99	6-11041B06	47k
6-185C01	6-11041B08	56k
6-185C02	6-11041B10	68k
6-185C03	6-11041B12	82k
6-185B04	6-11041B14	100k
6-185B05	6-11041B16	120k
6-185B06	6-11041B18	150k
6-185B07	6-11041B20	180k
6-185B08	6-11041B22	220k
6-185B09	6-11041B24	270k

CROSS-REFERENCE LIST: OLD vs NEW RESISTOR PART NUMBER (Cont.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/8 watt)
6-185C10	6-11041B26	330k
6-185C11	6-11041B28	390k
6-185C12	6-11041B30	470k
6-185C13	6-11041B32	560k
6-185C14	6-11041B34	680k
6-185C15	6-11041B36	820k
6-185C16	6-11041B38	1 meg

MOTOROLA INC.

instruction manual revision

--- IMPORTANT ---

This revision outlines changes that have occurred since the printing of your instruction manual. Use this information to correct your manual. This information applies to all issues (O,A,B, etc.) of the listed affected manuals.

INSTRUCTION MANUALS AFFECTED:

MOXY Two-Way FM Radio

68P81034E60	450-512 MHz (10 watts)
68P81036E05	25-50 MHz
68P81042E85	450-512 MHz (16 watts)
68P81043E95	150.8-174 MHz (45 watts)
68P81044E55	150.8-174 MHz (15/25 watts)
68P81044E65	450-512 MHz (30/25 watts)
68P81109E45	Options B330, B589

MAXAR Two-Way FM Radio

68P81025E70	136-174 MHz
68P81028E75	450-512 MHz (15 watts)
68P81031E40	450-512 MHz (Option B227)
68P81033E75	25-50 MHz
68P81037E05	403-420 MHz (15 watts)
68P81040E45	806-870 MHz ("B" Models)
68P81042E80	450-512 MHz (25 watts)
68P81044E05	150.8-174 MHz (50 watts)
68P81044E60	136-174 MHz (18 watts)
68P81109E23	Options B330, B589
68P81109E26	TRN8618A Time-Out-Timer
68P81109E27	TRN8619A Interface Kit
68P81109E65	Option B332

MAXAR-80 Two-Way FM Radio

68P81037E90	450-512 MHz
68P81037E95	136-174 MHz
68P81038E05	29.7-50 MHz
68P81038E15	Options B162-B165

68P81038E25	Options B561, B562, B563
68P81040E25	806-870 MHz (10 watts)
68P81044E07	TRN4237A Encoder/Decoder
68P81044E08	TRN4238A Encoder/Decoder
68P81044E50	150.8-174 MHz (85 watts)
68P81044E70	TX806-825 MHz, RX851-870 MHz (10 Watts)
68P81109E22	Option B549
68P81109E25	Option B262

REVISION DETAILS:

All 1/4 watt, carbon composition, fixed resistors used in equipment covered in the above listed manuals are replaced with ±5%, 1/4 watt, carbon film, fixed resistors. Use the following cross-reference list to update the parts lists in your manual.

CROSS-REFERENCE LIST: Old vs New Resistor Part Numbers

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/4 watt)
6-124A01	6-11009C01	10
6-124A02	6-11009C02	11
6-124A03	6-11009C03	12
6-124A04	6-11009C04	13
6-124A05	6-11009C05	15
6-124A06	6-11009C06	16
6-124A07	6-11009C07	18
6-124A08	6-11009C08	20
6-124A09	6-11009C09	22
6-124A10	6-11009C10	24
6-124A11	6-11009C11	27
6-124A12	6-11009C12	30
6-124A13	6-11009C13	33
6-124A14	6-11009C14	36
6-124A15	6-11009C15	39
6-124A16	6-11009C16	43
6-124A17	6-11009C17	47
6-124A18	6-11009C18	51
6-124A19	6-11009C19	56
6-124A20	6-11009C20	62
6-124A21	6-11009C21	68
6-124A22	6-11009C22	75
6-124A23	6-11009C23	82
6-124A24	6-11009C24	91
6-124A25	6-11009C25	100
6-124A26	6-11009C26	110
6-124A27	6-11009C27	120
6-124A28	6-11009C28	130
6-124A29	6-11009C29	150
6-124A30	6-11009C30	160

CROSS-REFERENCE LIST: Old vs New Resistor Part Numbers (Cont'd.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/4 watt)
6-124A31	6-11009C31	180
6-124A32	6-11009C32	200
6-124A33	6-11009C33	220
6-124A34	6-11009C34	240
6-124A35	6-11009C35	270
6-124A36	6-11009C36	300
6-124A37	6-11009C37	330
6-124A38	6-11009C38	360
6-124A39	6-11009C39	390
6-124A40	6-11009C40	430
6-124A41	6-11009C41	470
6-124A42	6-11009C42	510
6-124A43	6-11009C43	560
6-124A44	6-11009C44	620
6-124A45	6-11009C45	680
6-124A46	6-11009C46	750
6-124A47	6-11009C47	820
6-124A48	6-11009C48	910
6-124A49	6-11009C49	1k
6-124A50	6-11009C50	1.1k
6-124A51	6-11009C51	1.2k
6-124A52	6-11009C52	1.3k
6-124A53	6-11009C53	1.5k
6-124A54	6-11009C54	1.6k
6-124A55	6-11009C55	1.8k
6-124A56	6-11009C56	2k
6-124A57	6-11009C57	2.2k
6-124A58	6-11009C58	2.4k
6-124A59	6-11009C59	2.7k
6-124A60	6-11009C60	3k
6-124A61	6-11009C61	3.3k
6-124A62	6-11009C62	3.6k
6-124A63	6-11009C63	3.9k
6-124A64	6-11009C64	4.3k
6-124A65	6-11009C65	4.7k
6-124A66	6-11009C66	5.1k
6-124A67	6-11009C67	5.6k
6-124A68	6-11009C68	6.2k
6-124A69	6-11009C69	6.8k
6-124A70	6-11009C70	7.5k
6-124A71	6-11009C71	8.2k
6-124A72	6-11009C72	9.1k
6-124A73	6-11009C73	10k
6-124A74	6-11009C74	11k
6-124A75	6-11009C75	12k
6-124A76	6-11009C76	13k
6-124A77	6-11009C77	15k
6-124A78	6-11009C78	16k
6-124A79	6-11009C79	18k
6-124A80	6-11009C80	20k

CROSS-REFERENCE LIST: Old vs New Resistor Part Numbers (Cont'd.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/4 watt)
6-124A81	6-11009C81	22k
6-124A82	6-11009C82	24k
6-124A83	6-11009C83	27k
6-124A84	6-11009C84	30k
6-124A85	6-11009C85	33k
6-124A86	6-11009C86	36k
6-124A87	6-11009C87	39k
6-124A88	6-11009C88	43k
6-124A89	6-11009C89	47k
6-124A90	6-11009C90	51k
6-124A91	6-11009C91	56k
6-124A92	6-11009C92	62k
6-124A93	6-11009C93	68k
6-124A94	6-11009C94	75k
6-124A95	6-11009C95	82k
6-124A96	6-11009C96	91k
6-124A97	6-11009C97	100k
6-124A98	6-11009C98	110k
6-124A99	6-11009C99	120k
6-124B01	6-11009D01	130k
6-124B02	6-11009D02	150k
6-124B03	6-11009D03	160k
6-124B04	6-11009D04	180k
6-124B05	6-11009D05	200k
6-124B06	6-11009D06	220k
6-124B07	6-11009D07	240k
6-124B08	6-11009D08	270k
6-124B09	6-11009D09	300k
6-124B10	6-11009D10	330k
6-124B11	6-11009D11	360k
6-124B12	6-11009D12	390k
6-124B13	6-11009D13	430k
6-124B14	6-11009D14	470k
6-124B15	6-11009D15	510k
6-124B16	6-11009D16	560k
6-124B17	6-11009D17	620k
6-124B18	6-11009D18	680k
6-124B19	6-11009D19	750k
6-124B20	6-11009D20	820k
6-124B21	6-11009D21	910k
6-124B22	6-11009D22	1meg
6-124C01	6-11009C01	10
6-124C03	6-11009C03	12
6-124C05	6-11009C05	15
6-124C07	6-11009C07	18
6-124C09	6-11009C09	22
6-124C11	6-11009C11	27
6-124C13	6-11009C13	33
6-124C15	6-11009C15	39
6-124C17	6-11009C17	47
6-124C19	6-11009C19	56

CROSS-REFERENCE LIST: Old vs New Resistor Part Numbers (Cont'd.)

OLD PART NO. (carbon composition)	NEW PART NO. (carbon film)	OHMS (+5%, 1/4 watt)
6-124C21	6-11009C21	68
6-124C23	6-11009C23	82
6-124C25	6-11009C25	100
6-124C27	6-11009C27	120
6-124C29	6-11009C29	150
6-124C31	6-11009C31	180
6-124C33	6-11009C33	220
6-124C35	6-11009C35	270
6-124C37	6-11009C37	330
6-124C39	6-11009C39	390
6-124C41	6-11009C41	470
6-124C43	6-11009C43	560
6-124C45	6-11009C45	680
6-124C47	6-11009C47	820
6-124C49	6-11009C49	1k
6-124C51	6-11009C51	1.2k
6-124C53	6-11009C53	1.5k
6-124C55	6-11009C55	1.8k
6-124C57	6-11009C57	2.2k
6-124C59	6-11009C59	2.7k
6-124C61	6-11009C61	3.3k
6-124C63	6-11009C63	3.9k
6-124C65	6-11009C65	4.7k
6-124C67	6-11009C67	5.6k
6-124C69	6-11009C69	6.8k
6-124C71	6-11009C71	8.2k
6-124C73	6-11009C73	10k
6-124C75	6-11009C75	12k
6-124C77	6-11009C77	15k
6-124C79	6-11009C79	18k
6-124C81	6-11009C81	22k
6-124C83	6-11009C83	27k
6-124C85	6-11009C85	33k
6-124C87	6-11009C87	39k
6-124C89	6-11009C89	47k
6-124C91	6-11009C91	56k
6-124C93	6-11009C93	68k
6-124C95	6-11009C95	82k
6-124C97	6-11009C97	100k
6-124C99	6-11009C99	120k
6-124D02	6-11009D02	150k
6-124D04	6-11009D04	180k
6-124D06	6-11009D06	220k
6-124D08	6-11009D08	270k
6-124D10	6-11009D10	330k
6-124D12	6-11009D12	390k
6-124D14	6-11009D14	470k
6-124D16	6-11009D16	560k
6-124D18	6-11009D18	680k
6-124D20	6-11009D20	820k
6-124D22	6-11009D22	1meg

FLEXAR

68P81035E55 Base Station
68P81045E10 Base/Repeater Station

KITS AFFECTED:

TLB KIT

TLB8281A
TLB8282A
TLB8283A
TLB8284A
TLB8301A
TLB8302A
TLB8303A
TLB8304A
TLB8321A
TLB8322A
TLB8323A
TLB8324A
TLB8433A
TLB8442A
TLB8443A
TLB8444A
TLB8462A
TLB8463A
TLB8464A
TLB8482A
TLB8483A
TLB8484A

TLD KITS

TLD5411A
TLD5412A
TLD5413A
TLD5422A
TLD5423A
TLD5431A
TLD5432A
TLD5433A
TLD5441A
TLD5442B
TLD5443B
TLD5652A
TLD5661A
TLD5662A
TLD5663A
TLD5712A
TLD5722A
TLD5723A
TLD5821A
TLD5822A
TLD5823A
TLD5831B
TLD5832B
TLD5833B

TLD KITS (cont.)

TLD5911A
TLD5912A
TLD5913A
TLD5922A
TLD5923A
TLD5981A
TLD5982A
TLD5983A
TLD9062A
TLD9072A
TLD9073A
TLD9082A
TLD9083A
TLD9102A
TLD9103A

TLE KITS

TLE4003A
TLE4004A
TLE4013B
TLE4014B
TLE4015B
TLE4073A
TLE4074A
TLE4075A
TLE4083A
TLE4084A
TLE4085A
TLE4093A
TLE4094A
TLE4095A
TLE4103A
TLE4104A
TLE4105A
TLE4123A
TLE4203A
TLE4213A
TLE4221A
TLE5161A
TLE5163A
TLE5164A
TLE5165A
TLE5193A
TLE5194A
TLE5195A

TLE KITS

TLE8651B
TLE8653B
TLE8654B
TLE8655B
TLE8671A
TLE8673B
TLE8674B
TLE8675B
TLE8701A
TLE8703A
TLE8704B
TLE8705B
TLE8763B
TLE8764B
TLE8765B
TLE8773B
TLE8774B
TLE8775B
TLE8953A
TLE8954A
TLE8955A
TLE8963A
TLE8964A
TLE8965A
TLE8983A
TLE8991A
TLE8993A
TLE8994A
TLE8995B

TLF KITS

TLF6321A
TLF6321B
TLF6331A

TRN KITS

TRN4003A
TRN4010A
TRN4012A
TRN4238A
TRN5274B
TRN6203A
TRN6222A

TRN KITS (cont.)

TRN6368A
TRN6369A
TRN6370A
TRN6371A
TRN6372A
TRN6543A
TRN6760A
TRN6827A
TRN6828A
TRN6850A
TRN6851A
TRN6852A

TRN KITS (cont.)

TRN6908A
TRN6933A
TRN6934A
TRN8002A
TRN8014A
TRN8034A
TRN8113A
TRN8115A
TRN8243A

TRN KITS (cont.)

TRN8389A
TRN8425A
TRN8426A
TRN8482A
TRN8508A
TRN8509A
TRN8619A
TRN8695A

TRN KITS (cont.)

TRN8708A
TRN8709A
TRN8878A

REVISION DETAILS:

All 1/2 watt, carbon composition, fixed resistors used in kits listed under Kits Affected are replaced with ±5%; 1/2 watt, carbon film, fixed resistors. Use the following list to update the parts lists in your manual.

OHMS (±5%; 1/2 W)	NEW PART NO. (carbon film)	OHMS (±5%; 1/2 W)	NEW PART NO. (carbon film)	OHMS (±5%; 1/2 W)	NEW PART NO. (carbon film)
10	6-11045A01	620	6-11045A44	39k	6-11045A87
11	6-11045A02	680	6-11045A45	43k	6-11045A88
12	6-11045A03	750	6-11045A46	47k	6-11045A89
13	6-11045A04	820	6-11045A47	51k	6-11045A90
15	6-11045A05	910	6-11045A48	56k	6-11045A91
16	6-11045A06	1,000	6-11045A49	62k	6-11045A92
18	6-11045A07	1,100	6-11045A50	68k	6-11045A93
20	6-11045A08	1,200	6-11045A51	75k	6-11045A94
22	6-11045A09	1,300	6-11045A52	82k	6-11045A95
24	6-11045A10	1,500	6-11045A53	91k	6-11045A96
27	6-11045A11	1,600	6-11045A54	100k	6-11045A97
30	6-11045A12	1,800	6-11045A55	110k	6-11045A98
33	6-11045A13	2,000	6-11045A56	120k	6-11045A99
36	6-11045A14	2,200	6-11045A57	130k	6-11045B01
39	6-11045A15	2,400	6-11045A58	150k	6-11045B02
43	6-11045A16	2,700	6-11045A59	160k	6-11045B03
47	6-11045A17	3,000	6-11045A60	180k	6-11045B04
51	6-11045A18	3,300	6-11045A61	200k	6-11045B05
56	6-11045A19	3,600	6-11045A62	220k	6-11045B06
62	6-11045A20	3,900	6-11045A63	240k	6-11045B07
68	6-11045A21	4,300	6-11045A64	270k	6-11045B08
75	6-11045A22	4,700	6-11045A65	300k	6-11045B09
82	6-11045A23	5,100	6-11045A66	330k	6-11045B10
91	6-11045A24	5,600	6-11045A67	360k	6-11045B11
100	6-11045A25	6,200	6-11045A68	390k	6-11045B12
110	6-11045A26	6,800	6-11045A69	430k	6-11045B13
120	6-11045A27	7,500	6-11045A70	470k	6-11045B14
130	6-11045A28	8,200	6-11045A71	510k	6-11045B15
150	6-11045A29	9,100	6-11045A72	560k	6-11045B16
160	6-11045A30	10k	6-11045A73	620k	6-11045B17
180	6-11045A31	11k	6-11045A74	680k	6-11045B18
200	6-11045A32	12k	6-11045A75	750k	6-11045B19
220	6-11045A33	13k	6-11045A76	820k	6-11045B20
240	6-11045A34	15k	6-11045A77	910k	6-11045B21
270	6-11045A35	16k	6-11045A78	1 meg	6-11045B22
300	6-11045A36	18k	6-11045A79		
330	6-11045A37	20k	6-11045A80		
360	6-11045A38	22k	6-11045A81		
390	6-11045A39	24k	6-11045A82		
430	6-11045A40	27k	6-11045A83		
470	6-11045A41	30k	6-11045A84		
510	6-11045A42	33k	6-11045A85		
560	6-11045A43	36k	6-11045A86		

MOTOROLA INC.

instruction manual revision

GENERAL

This revision outlines changes that have occurred since the printing of your instruction manual. Use this information to correct your manual.

INSTRUCTION MANUALS AFFECTED:

68P81028E75-H	MAXAR TWO-WAY FM RADIO 450-512 MHz, 15W
68P81033E75-C	MAXAR TWO-WAY FM RADIO 25-28 MHz, 29.7-50 MHz, 25/50W
68P81034E60-C	MOXY TWO WAY FM RADIO 450-512 MHz, 10W
68P81036E05-C	MOXY TWO-WAY FM RADIO 25-50 MHz, 25W & 29.7-50 MHz 60W
68P81037E90-D	MAXAR-80 TWO WAY FM RADIO 450-512 MHz, 30/25W & 2W L.P.I.
68P81037E95-C	MAXAR-80 TWO-WAY FM RADIO 136-174 MHz, 2/25/55W
68P81040E25-A	MAXAR-80 TWO WAY FM RADIO 806-870 MHz, 10W
68P81042E80-C	MAXAR TWO-WAY FM RADIO 450-512 MHz, 30/25W
68P81042E85-B	MOXY TWO-WAY FM RADIO 450-512 MHz, 16W
68P81043E95-B	MOXY TWO-WAY FM RADIO 150.8-174 MHz, 45W
68P81044E05-B	MAXAR TWO-WAY FM RADIO 150.8 174 MHz, 50W
68P81044E50-B	MAXAR-80 TWO-WAY FM RADIO 150.8-174 MHz, 85W
68P81044E55-A	MOXY TWO-WAY FM RADIO 150.8-174 MHz, 15W & 136-174 MHz, 25W
68P81044E60-A	MAXAR TWO-WAY FM RADIO 136-174 MHz, 20W
68P81044E65-B	MOXY TWO-WAY FM RADIO 450-512 MHz, 30/25W
68P81061E25-O	MAXAR-80 TWO-WAY FM RADIO 150.8-162 MHz, 100W
68P81061E30-O	MAXAR TWO-WAY FM RADIO 150.8-174 MHz, 40W
68P81062E05-O	MAXAR TWO-WAY FM RADIO 136-174 MHz, 25W

REVISION DETAILS:

Replace the desk microphone instruction section 68P81060E04 in your instruction manual, with the attached, revised desk microphone instruction 68P81060E04-E.

ATTACHMENT: Desk Microphone Instruction Section.....68P81060E04-E

DESK MICROPHONES

MODELS TMN1008B/C, TMN1009B/C, TMN1018B/C, TMN1021B/C, TMN1022B/C

FUNCTION

The desk microphones provide a desk surface self-supporting stand to mount the TRANSMIT and PL MONITOR switches and to support the electret condenser microphone element at mouth level. The TMN1008B/C, and TMN1022B/C are used in *Private-Line* squelch systems and provide both TRANSMIT and MONITOR switches; the TMN1009B/C, and TMN1021B/C are used with carrier squelch systems and use only the TRANSMIT switch. The TMN1018B/C is used in paging applications and includes both TRANSMIT and MONITOR switches.

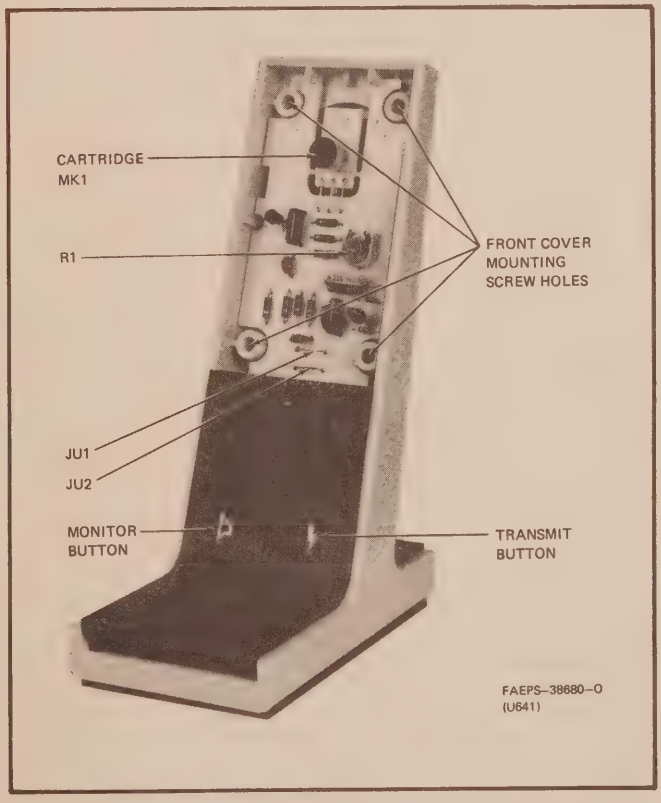
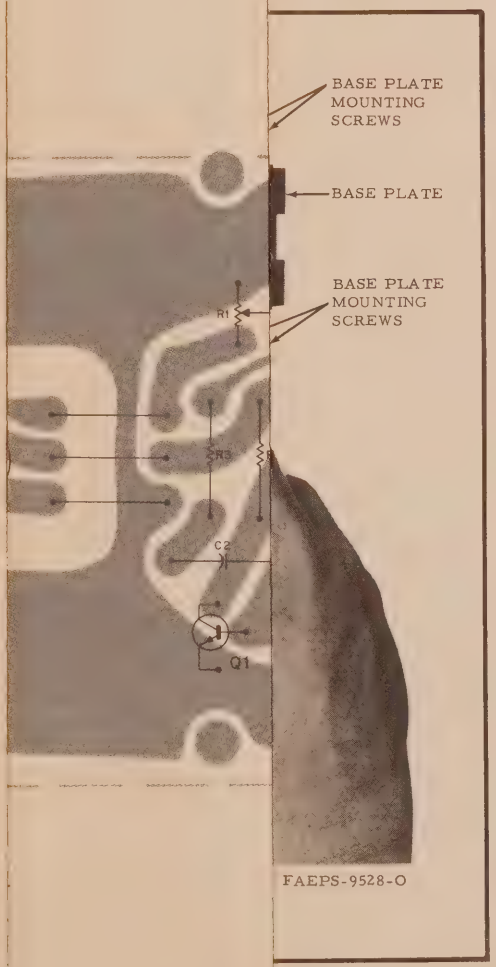


Figure 1. Microphone Detail



Detail

68P81060E04-E
1/26/84- PHI

DESK MICROPHONES

MODELS TMN1008B/C, TMN1009B/C, TMN1018B/C, TMN1021B/C, TMN1022B/C

FUNCTION

The desk microphones provide a desk surface self-supporting stand to mount the TRANSMIT and PL MONITOR switches and to support the electret condenser microphone element at mouth level. The TMN1008B/C, and TMN1022B/C are used in *Private-Line* squelch systems and provide both TRANSMIT and MONITOR switches; the TMN1009B/C, and TMN1021B/C are used with carrier squelch systems and use only the TRANSMIT switch. The TMN1018B/C is used in paging applications and includes both TRANSMIT and MONITOR switches.

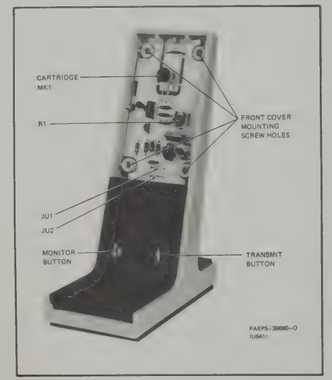


Figure 1. Microphone Detail

68P81060E04-E
1/26/84-PHI

parts list

THN6388A Housing & Hardware Kit (Carrier Squelch)
THN6415B Housing & Hardware Kit (Carrier Squelch)
THN6404A Housing & Hardware Kit (*Private-Line*)
THN6404B Housing & Hardware Kit (*Private-Line*) PL-7493-E

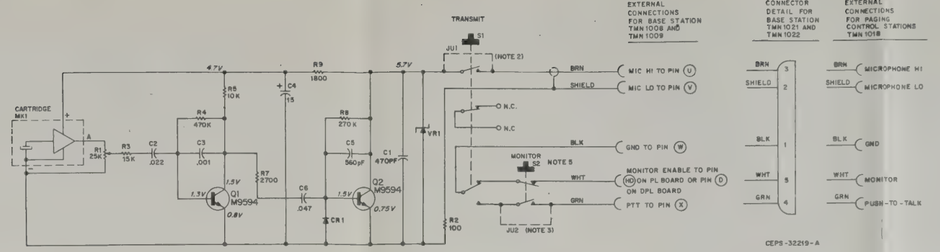
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch, microphone:
S1	40-84711E02	leaf (THN6388A, THN6415B)
S2	40-84711E03	leaf (THN6404A/B)
		non-referenced items
	2-10101A89	NUT, spring: 2 used
	3-135102	SCREW, switch mtg.: 4-40 x 1/4"; 3 used
	3-138809	SCREW, baseplate: 4-40 x 5/16"; 4 used
	3-140251	SCREW, front cover: 4-20 x 3/4"; 4 used
	4-10058B10	WASHER, felt (THN6404A/B)
	15-82976M04	COVER, front
	15-82978M04	COVER, rear
	15-84191E01	HOUSING, microphone (THN6388A, THN6404A)
	15-84191E03	HOUSING, microphone (THN6415B, THN6404B)
	22-82591C05	PIN, roll (THN6388A, THN6415B)
	38-84184E07	BUTTON, blank (THN6388A, THN6415B)
	38-84184E08	BUTTON, "MONITOR" (THN6404A, THN6404B)
	38-84192E04	BUTTON, "TRANSMIT"
	42-82143C05	CLAMP, cable
	42-84725E01	CLIP, shaft retainer
	47-84193E01	SHAFT, button mtg: pivot
	47-84194E01	SHAFT, extension
	47-84723E01	SHAFT, coupling (THN6388A, THN6415B)
	64-82977M01	PLATE, base
	75-84722E01	PAD, base plate

note: TMN Series "B" model microphone parts and TMN Series "C" model microphone parts are not interchangeable. This note does not apply to HMN1005A and HMN1012A.

TRN4315A Microphone Circuit Board PL-6863-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 500 V: unless otherwise stated
C1	21-82187B45	470 pF
C2	8-82096J08	.022; 250 V
C3	21-82187B44	.001; 100 V
C4	23-84665F09	15 + 150 -10%; 25 V
C5	21-82187B06	560 pF
C6	8-82096J04	.047; 250 V
		diode: (see note)
CR1	48-83654H01	silicon
		cartridge, microphone:
MK1	50-82825M02	electret
		transistor: (see note)
Q1, 2	48-869584	NPN; type M9594
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R1	18-84944C02	variable: 25k ± 20%
R2	6-11009C25	100
R3	6-11009C77	15k
R4	6-11009D14	470k
R5	6-11009C73	10k
R7	6-11009C59	2.7k
R8	6-11009D06	270k
R9	6-11009C55	1.8k
		diode: (see note)
VR1	48-82256C38	Zener; 9.1 V ± 5%

note: For optimum performance diodes, transistors and integrated circuits must be ordered by Motorola part numbers.



NOTES:
1. UNLESS OTHERWISE STATED: ALL CAPACITOR VALUES ARE IN MICROFARADS
2. REMOVE JU1 FOR PARALLEL OPERATION.
3. REMOVE JU2 TO MONITOR BEFORE TRANSMIT.
4. ALL DC VOLTAGE READINGS ARE WITH RESPECT TO THE MIC LO LEAD.
5. MONITOR SWITCH S2 IS PRESENT IN MODELS TMN1008, TMN1018, AND TMN1022 ONLY.

DESK MICROPHONE MODEL COMPLEMENT

TMN1008C	TMN1009C	TMN1018C	TMN1021C	TMN1022C	DESCRIPTION
X	X	X	X	X	TRN4315A MICROPHONE CIRCUIT BOARD
X		X		X	THN6404B MICROPHONE HOUSING AND HARDWARE KIT (PL AND DPL) (SEE NOTE)
	X		X		THN6415B MICROPHONE HOUSING AND HARDWARE KIT (CARRIER SQUELCH) (SEE NOTE)
X	X				TKN8093A CABLE KIT
		X			TKN8094A CABLE KIT
			X	X	TKN8095A CABLE KIT

NOTE: THE TMN1008B,18B, AND 22B USE THE THN6404A HOUSING INSTEAD OF THE THN6404B. THE TMN 1008B AND 21B USE THE THN6388A HOUSING INSTEAD OF THE THN6415B

TKN8094A Cable Kit, "Maxar" Paging Base Station PL-6865-A

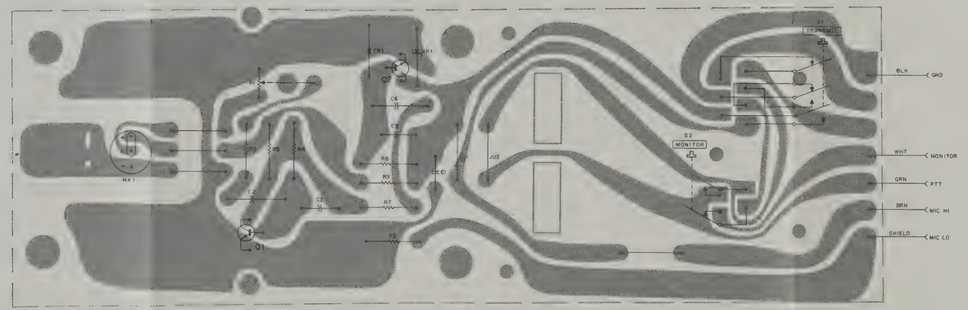
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	29-847854	LUG, slatted tongue: 5 used
	30-83560A02	CABLE, 6-conductor: 48" long
	37-82633B13	GROMMET, rubber

TKN8095A Cable Kit, "Maxar 80" Base Station PL-6866-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-82062M01	HOUSING, cable
	28-82005M01	CONNECTOR, plug: 5-contact
	30-83560A02	CABLE, 6-conductor: 60" long
	37-82633E13	GROMMET, rubber
	42-82061M01	CLAMP, cable
	43-82063M01	COLLAR
	29-83277G01	LUG, cable: 5-used

TKN8093A Cable Kit, "Maxar" Base Station PL-6864-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	30-83560A02	CABLE, 6-conductor; 60" long
	39-10184A24	CONTACT, receptacle: 5 used
	37-82633B13	GROMMET, rubber



E B C
TRANSISTOR BASE DETAIL

SHOWN FROM COMPONENT SIDE

SOLDER SIDE 80-DEPS-29074-A
DL-DEPS-29075-B

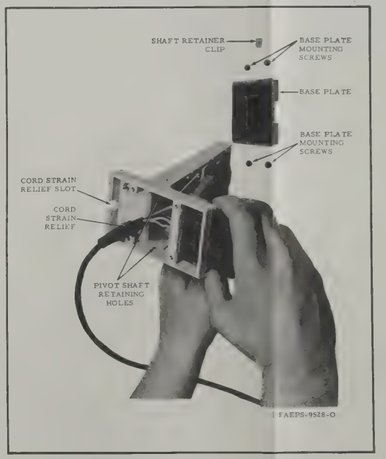


Figure 2. Microphone Assembly Detail

MOTOROLA INC.

instruction manual revision

Supersedes SMR-4449

GENERAL

This revision outlines changes that have occurred since the printing of your instruction manual. Use this information to correct your manual.

INSTRUCTION MANUAL AFFECTED:

Maxar-80 Two-Way FM Radio

68P81037E90-D	450-512 MHz
68P81037E95-B	136-174 MHz
68P81038E05-B	29.7-50 MHz
68P81040E25-A	806-870 MHz

Maxar Two-Way FM Radio

68P81028E75-H	450-512 MHz
68P81033E75-C	25-50 MHz
68P81042E80-C	450-512 MHz
68P81044E05-B	150.8-174 MHz
68P81062E05-O	136-174 MHz

Moxy Two-Way FM Radio

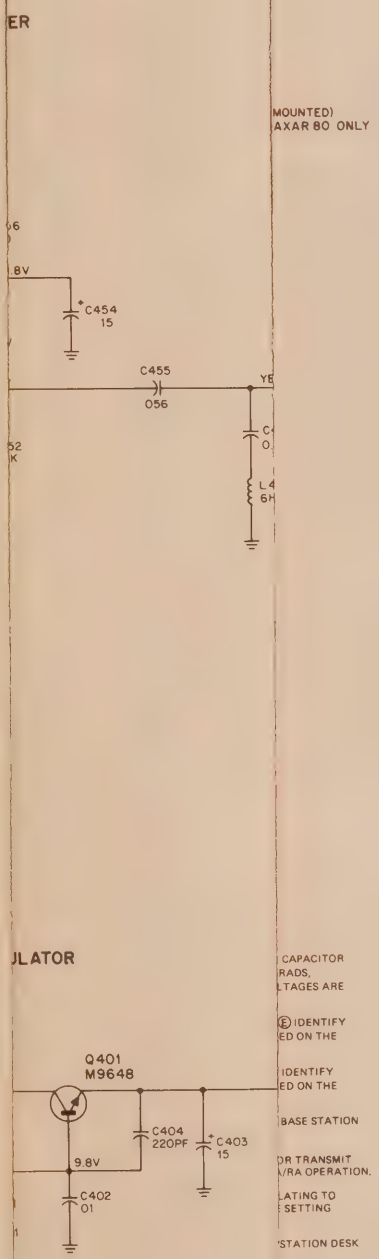
68P81034E60-C	450-512 MHz
68P81043E95-B	150.8-174 MHz
68P81044E55-A	150.8-174 MHz

REVISION DETAILS:
The attached instruction sheet provides servicing information for the Reedless Tone *Private-Line* Encoder/Decoder TRN4237A. Add this sheet to your manual.

ATTACHMENT:
Reedless Tone *Private-Line* Encoder/Decoder
TRN4237A.....PEPS-31303-D

REEDLESS TONE *PRIVATE-LINE* SQUELCH ENCODER/DECODER

MODEL TRN4237A



FUNCTION

Encodes and decodes sub-audible *Private-Line* tones. Encoder modulates transmitter. Decoder unsquelches receiver when proper incoming tone is detected.

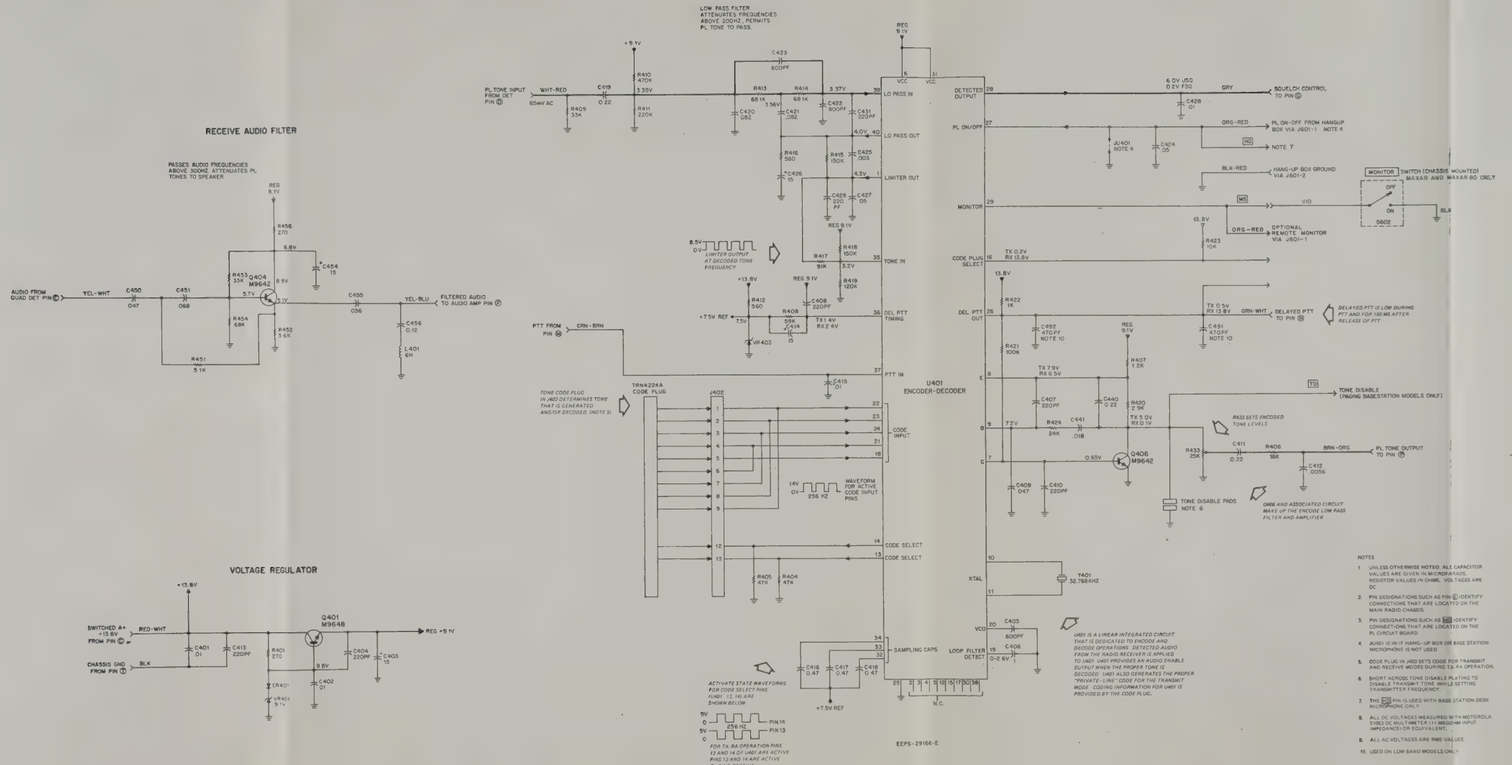
Motorola No. ***PEPS-31303-D***
(Sheet 1 of 2)
3/28/84- PHI

REEDLESS TONE *PRIVATE-LINE* SQUELCH ENCODER/DECODER

MODEL TRN4237A

FUNCTION

Encodes and decodes sub-audible *Private-Line* tones. Encoder modulates transmitter. Decoder unsquelches receiver when proper incoming tone is detected.


RECEIVE AUDIO FILTER
PASSES AUDIO FREQUENCIES ABOVE 300HZ ATTENUATES PL TONES TO SPEAKER
AUDIO FROM QUAD DET PIN 2
FILTERED AUDIO TO AUDIO AMP PIN 7
VOLTAGE REGULATOR
SWITCHED A+ +13.8V FROM PIN 4
CHASSIS GND FROM PIN 1
REG +5 1V
LOW PASS FILTER ATTENUATES FREQUENCIES ABOVE 200HZ, PERMITS PL TONE TO PASS.
PL TONE INPUT FROM DET PIN 3
LIMITER OUTPUT AT DECODED TONE FREQUENCY
PTT FROM PIN 8
TONE CODE PLUG IN J402 DETERMINES TONE THAT IS GENERATED AND/OR DECODED. (NOTE 5)
TRN4224A CODE PLUG
J402
WAVEFORMS FOR ACTIVE CODE INPUT PINS
ACTIVATE STATE WAVEFORMS FOR CODE SELECT PINS FUNC 12, 14 ARE SHOWN BELOW.
PIN 15
PIN 13
FOR TX PA OPERATION PINS 12 AND 14 OF U401 ARE ACTIVE PINS 13 AND 14 ARE ACTIVE DURING RECEIVE
U401 ENCODER-DECODER
SAMPLING CAPS
LOOP FILTER DETECT
N.C.
DETECTED OUTPUT
PL ON/OFF
MONITOR
CODE PLUG SELECT
DEL PTT OUT
XTAL
VCO
6.0V VSQ 0.2V PSQ
SQUELCH CONTROL TO PIN 10
PL ON-OFF FROM HANGUP BOX VIA J601-1 NOTE 4
NOTE 7
HANG-UP BOX GROUND VIA J601-2
MONITOR SWITCH (CHASSIS MOUNTED) MAXAR AND MAXAR 80 ONLY
S602
OPTIONAL REMOTE MONITOR VIA J601-1
DELAYED PTT TO PIN 6
DELAYED PTT IS LOW DURING PTT AND FOR 150 MS AFTER RELEASE OF PTT
TONE DISABLE (PAGING BASESTATION MODELS ONLY)
R433 SETS ENCODED TONE LEVELS
PL TONE OUTPUT TO PIN 9
TONE DISABLE PADS NOTE 6
OMB AND ASSOCIATED CIRCUIT MAKE UP THE ENCODE LOW PASS FILTER AND AMPLIFIER
Y401 32.768KHZ
U401 IS A LINEAR INTEGRATED CIRCUIT THAT IS DEDICATED TO ENCODE AND DECODE OPERATIONS. DETECTED AUDIO FROM THE RADIO RECEIVER IS APPLIED TO U401 WHICH PROVIDES AN AUDIO FAMILY OUTPUT WHEN THE PROPER TONE IS DECODED. U401 ALSO GENERATES THE PROPER "PRIVATE-LINE" CODE FOR THE TRANSMIT MODE. CODING INFORMATION FOR U401 IS PROVIDED BY THE CODE PLUG.
EEPS-29166-E

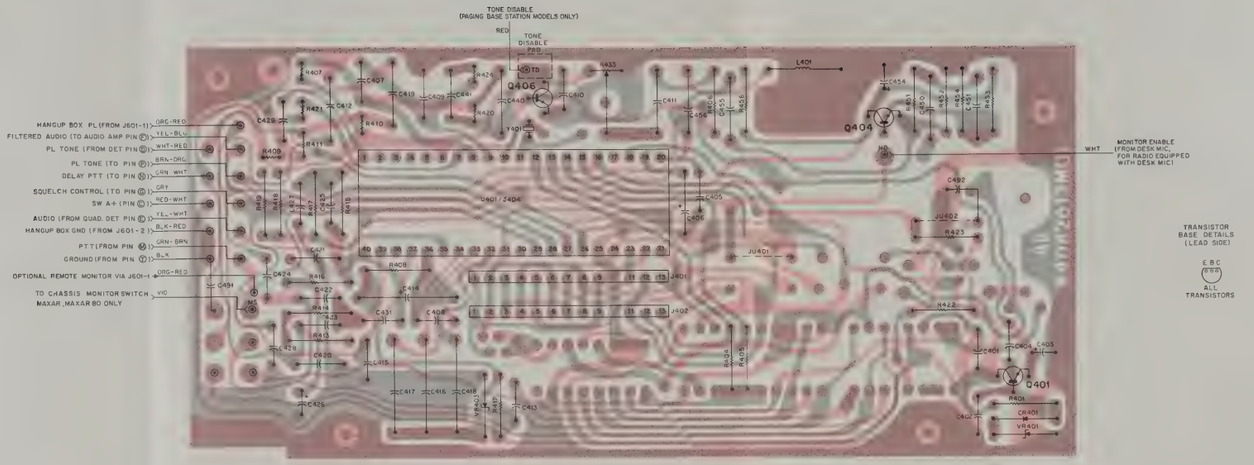
NOTES

1. UNLESS OTHERWISE NOTED, ALL CAPACITOR VALUES ARE GIVEN IN MICROFARADS. RESISTOR VALUES IN OHMS. VOLTAGES ARE DC.
2. PIN DESIGNATIONS SUCH AS PIN 2 IDENTIFY CONNECTIONS THAT ARE LOCATED ON THE MAIN RADIO CHASSIS.
3. PIN DESIGNATIONS SUCH AS J602 PIN 1 IDENTIFY CONNECTIONS THAT ARE LOCATED ON THE PL CIRCUIT BOARD.
4. AUDIO IS IN IF HANG-UP BOX OR BASE STATION MICROPHONE IS NOT USED.
5. CODE PLUG IN J402 SETS CODE FOR TRANSMIT AND RECEIVE MODES DURING TX RX OPERATION.
6. SHORT ACROSS TONE DISABLE PADS RELATIVE TO CHASSIS TO DISABLE TONE WHILE SETTING TRANSMITTER FREQUENCY.
7. THIS PIN IS USED WITH BASE STATION DESK MICROPHONE ONLY.
8. ALL DC VOLTAGES MEASURED WITH MOTOROLA 1150D DC MULTIMETER (11 MEGOHM INPUT IMPEDANCE OR EQUIVALENT).
9. ALL AC VOLTAGES ARE RMS VALUES.
10. USED ON LOW BAND MODELS ONLY.

Motorola No. PEPS-31303-D
(Sheet 1 of 2)
3/28/84- PHI

REEDLESS TONE *PRIVATE-LINE* SQUELCH ENCODER/DECODER

MODEL TRN4237A



SHOWN FROM SOLDER SIDE

SOLDER SIDE © 80-DEPS-29164-A
COMPONENT SIDE 80-DEPS-29165-D
OL-DEPS-29163-D

Motorola No. ***PEPS-31303-D***
(Sheet 2 of 2)
3/28/84- PHI

parts list

TRN4237A Reedless Tone *Private-Line* Encoder/Decoder PL-6778-D

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 500 V: unless otherwise stated
C401, 402	21-83596E36	.01 + 60-40%; 250 V
C403	23-84665F02	15 + 100-10%; 25 V
C404	21-83596E10	220 pF ± 20%
C405	21-851299	600 pF
C406	23-84762H06	1 ± 20%; 35 V
C407, 408	21-83596E10	220 pF ± 20%
C409	8-84637L31	.047; 250 V
C410	21-83596E10	220 pF ± 20%
C411	8-84637L22	0.22; 100 V
C412	8-83813H26	.0056 ± 5%; 50 V
C413	21-83596E10	220 pF ± 20%
C414	23-82783B13	15 ± 5%; 25 V
C415	21-83596E36	.01 + 60-40%; 250 V
C416, 417, 418	8-84637L42	0.47; 100 V
C419	8-84637L22	0.22; 100 V
C420, 421	8-84637L36	.082 ± 5%; 100 V
C422	21-82073F01	600 pF
C423	21-82428B34	600 pF
C424	21-82372C10	.05; ± 20%; 25 V
C425	21-82187B16	.003; 100 V
C426	23-84665F02	15 + 100-10%; 25 V
C427	21-82372C10	.05 ± 20%; 25 V
C428	21-83596E36	.01 + 60-40%; 250 V
C429, 431	21-83596E10	220 pF ± 20%
C440	8-84637L22	0.22; 100 V
C441	8-84637L28	.018; 250 V
C450	8-82905G03	.047 ± 5%, 50 V
C451	8-83813H23	.068 ± 5%; 50 V
C454	23-84665F02	15 + 100-10%; 25 V
C455	8-82905G16	.056 ± 5%; 200 V
C456	8-84637L18	0.12 ± 5%; 100 V
C491, 492	21-82187B07	470 pF ± 10%; 500 V (low band only)
		diode: (see note)
CR401	48-83654H01	silicon
		connector, receptacle:
J401, 402	9-82071K01	female, socket; 13 contact
J404	9-84881F03	female; socket; 40-contact
		coil, rf:
L401	25-82498H02	choke; 6 H, 10%
		transistor: (see note)
Q401	48-869648	NPN; type M9648
Q404, 406	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R401	6-124A35	270
R404, 405	6-124C89	47k ± 10%
R406	6-124C79	18k ± 10%
R407	6-10621C03	1.2k ± 1%; 1/8 W
R408	6-10821D66	59k ± 1%; 1/8 W
R409	6-124A55	33k
R410	6-124B14	470k
R411	6-124B06	220k
R412	6-124A43	560
R413, 414	6-83175C68	68.1k ± 1%
R415	6-124B02	150k
R416	6-124A43	560
R417	6-124A96	91k
R418	6-124B02	150k
R419	6-124A99	120k
R420	6-10621C40	2.9k ± 1%; 1/8 W
R421	6-124C97	100k ± 10%
R422	6-124C49	1k ± 10%
R423	6-124C73	10k ± 10%
R424	6-124A82	24k
R433	18-84944C02	variable, 25k
R451	6-124A66	5.1k
R452	6-124A67	5.6k
R453	6-124A85	33k
R454	6-124A93	68k
R456	6-124A35	270
		integrated circuit: (see note)
U401	51-83977M17	type M7717
		voltage regulator: (see note)
VR401	48-82256C38	Zener type; 9.1 V
VR403	48-82256C44	Zener type; 7.5 V
		crystal:
Y401	48-80055C01	32.768 kHz
		mechanical parts
	42-10217A02	STRAP, tie (WHT); 3 used
	29-82713M01	TERMINAL, BRS; 14 used
	39-19184A24	CONTACT, receptacle; 11 used
	29-84706E06	TERMINAL, crimp socket; 2 used

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

MOTOROLA INC.
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MAXAR-80

TWO-WAY FM RADIO
30 W/25 W RF POWER
2 W/3 W L.P.I. RF POWER
450-512 MHz

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68P81037E90-D
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SECTION *NUMBER*

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TPN1154A BASE STATION POWER SUPPLY SCHEMATIC DIAGRAMS, CIRCUIT BOARD DETAIL, PARTS LIST AND POWER CABLES, MODELS TKN6948A, TKN6949A, AND TKN8199A 68P81034E86

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TSN1003A SPEAKER/AMPLIFIER CONNECTION DIAGRAM FOR *MAXAR-80* L.P.I RADIO SETS 68P81047E33

FOREWORD

1. SCOPE OF MANUAL

This manual is intended for use by experienced technicians familiar with similar types of equipment. It contains all service information required for the equipment described and is current as of the printing date. Changes which occur after the printing date are incorporated by Instruction Manual Revisions (SMR). These SMR's are added to the manuals as the engineering changes are incorporated into the equipment.

2. MODEL AND KIT IDENTIFICATION

Motorola equipments are specifically identified by an overall model number on the nameplate. In most cases, assemblies and kits which make up the equipment also have kit model numbers stamped on them. When a production or engineering change is incorporated, the applicable schematic diagrams are updated.

3. SERVICE

Motorola's National Service Organization offers one of the finest nation-wide installation and maintenance programs available to communication equipment users. This organization includes approximately 900 authorized Motorola Service Stations (MSS) located throughout the United States, each manned by one or more trained, FCC licensed technicians.

These MSS's are independently owned and operated and were selected by Motorola to service its customers. Motorola maintenance is available on either a time and material basis or on a periodic fixed-fee type arrangement.

The administrative staff of this organization consists of national, area and district service managers and district representatives, all of whom are Motorola employees with the objective to improve the service to our customers.

Should you wish to purchase a service contract for your Motorola equipment, contact your Motorola Service Representative, or write to:

National Service Manager
Motorola Communications and Electronics, Inc.
1303 E. Algonquin Road
Schaumburg, Illinois 60196

4. REPLACEMENT PARTS ORDERING

Motorola maintains a number of parts offices strategically-located throughout the United States. These facilities are staffed to process parts orders, identify part numbers, and otherwise assist in the maintenance and repair of Motorola Communications Sector products.

Orders for all parts *except* crystals, active filters, channel elements, and "Vibrasender" ® and "Vibrasponder" ® resonant reeds should be sent to the nearest area parts center. Orders for instruction manuals should also be sent to the area parts center.

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

Orders for crystals, channel elements, active filters, and reeds should be sent directly to the factory address listed in paragraph 5.5. Crystal and channel element orders should specify the crystal or channel element type number, crystal and carrier frequency, and the chassis model number in which the part is used.

Orders for active filters, PROMs, code plugs, *Vibrasender* and *Vibrasponder* resonant reeds should specify type number and frequency, should identify the owner/operator of the communications system in which these items are to be used; and should include any serial numbers stamped on the components being replaced.

5. ADDRESSES

5.1 NATIONAL ACCOUNTS

PARTS ORDER ADMINISTRATION
Telephone, Airline, and
Railroad Sales
Phone: 312-576-6512
1313 E. Algonquin Road
Schaumburg, Illinois 60196
Phone: 312-576-3900
TWX: 910-693-0869

5.2 U.S. ORDERS

WESTERN AREA PARTS
1170 Chess Drive, Foster City,
San Mateo, California 94404
Phone: 415-349-8621
TWX: 910-375-3877

MIDWEST AREA PARTS
1313 E. Algonquin Road
Schaumburg, Ill. 60196
Phone: 312-576-7430
TWX: 910-693-0869

MID-ATLANTIC AREA PARTS
7230 Parkway Drive
Hanover, Maryland 20176
Phone: 301-796-8763
TWX: 710-862-1941

EAST CENTRAL AREA PARTS
12995 Snow Road,
Parma, Ohio 44130
Phone: 216-433-1560
TWX: 810-427-9424

EASTERN AREA PARTS
85 Harristown Road,
Glen Rock, New Jersey 07452
Phone: 201-447-4000
TWX: 710-988-5614

PACIFIC SOUTHWESTERN AREA PARTS
P.O. Box 85036
San Diego, California 92138
Street Address:
9980 Carroll Canyon Road
San Diego, California 92131
Phone: 619-578-8030
TWX: 619-578-2210

GULF STATES AREA PARTS
1140 Cypress Station
P.O. Box 73115
Houston, Texas 77090
Phone: 713-537-3636
TWX: 910-881-6392

ROCKY MOUNTAIN AREA PARTS
20 Inverness Place East
Englewood, Colorado 80112
Phone: 303-790-2323
TWX: 910-935-0785

SOUTHWESTERN AREA PARTS
P.O. Box 34290
3320 Belt Line Road,
Dallas, Texas 75234
Phone: 214-620-8511
TWX: 910-860-5505

SOUTHEASTERN AREA PARTS
P.O. Box 368
Decatur, Georgia 30031
Street Address:
5096 Panola Industrial Blvd.
Decatur, Georgia 30032
Phone: 404-987-2232
TWX: 810-766-0876

5.3 CANADIAN ORDERS

MOTOROLA LTD.
National Parts Department
3125 Steeles Avenue East
Willowdale, Ontario M2H 2H6
Phone: 416-499-1441
TWX: 610-491-1032
Telex: 06-526258

5.4 ALL COUNTRIES EXCEPT U.S. AND CANADA

MOTOROLA, INC.
International Parts Dept.
1313 E. Algonquin Road
Schaumburg, Illinois 60196 U.S.A.
Phone: 312-576-7241
TWX: 910-693-0869
Telex: 722443
Cable: MOTOL PARTS

5.5 FACTORY ADDRESS FOR CRYSTAL, CHANNEL ELEMENT, ACTIVE FILTER, AND RESONANT REED ORDERS

ALL MAIL ORDERS
Motorola, Inc.
Component Products Sales & Service
P.O. Box 66191
O'Hare International Airport
Chicago, Ill. 60666

CORRESPONDENCE
Motorola, Inc.
Component Products Sales & Service
2553 N. Edgington Street
Franklin Park, Illinois 60131
Phone: 312-451-1297
TWX: 910-227-0799
Telex: 433-0067

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GENERAL SAFETY INFORMATION

The United States Department of Labor, through the provisions of the Occupational Safety and Health Act of 1970 (OSHA), has established an electromagnetic energy safety standard which applies to the use of this equipment. Proper use of this radio will result in exposure below the OSHA limit. The following precautions are recommended:

DO NOT operate the transmitter of a mobile radio when someone outside the vehicle is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of a fixed radio (base station, microwave and rural telephone rf equipment) or marine radio when someone is within two feet (0.6 meter) of the antenna.

DO NOT operate the transmitter of any radio unless all RF connectors are secure and any open connectors are properly terminated.

In addition,

DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.

All equipment must be properly grounded according to Motorola installation instructions for safe operation.

All equipment should be serviced only by a qualified technician.

Refer to the appropriate section of the product service manual for additional pertinent safety information.

WARNING

For vehicles equipped with electronic anti-skid braking systems see "ANTI-SKID BRAKING PRECAUTIONS" Publication, Motorola Number 68P81109E34.

SAFETY INFORMATION FOR RADIOS INSTALLED IN VEHICLES POWERED BY LIQUEFIED PETROLEUM (LP) GAS

WARNING

It is mandatory that radio installations in vehicles fueled by liquefied petroleum gas conform to the following standard.

National Fire Protection Association standard NFPA 58 applies to radio installations in vehicles fueled by liquefied petroleum (LP) gas with the LP-gas container in the trunk or other sealed-off space within the interior of the vehicles. This standard requires that:

1. Any space containing radio equipment shall be isolated by a seal from the space in which the LP-gas container and its fittings are located.
2. Remote (outside) filling connections shall be used.
3. Venting of the container space to the outside shall be provided.

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SPECIFICATIONS FOR *MAXAR-80* 30 W/25 W

GENERAL

Maximum Battery Drain at 13.6 V	Transmit	Receive	Standby (Squelched)
	9.2 A	1.0 A	0.3 A
Frequency Range	450-512 MHz		
Dimensions	2-1/2" H x 6-1/2" W x 10-1/2" D		
Weight	5.3 lbs. (2407g)		

TRANSMITTER

RF Power Output	30 Watts (450-512 MHz), 25 Watts (470-512 MHz)
Spurious & Harmonic Emmissions*	70 dB below carrier
Output Impedance	50 ohms
Frequency Stability	±0.0005%; -30°C to +60°C (+25°C reference) ±0.0002% (Optional Base Only)
Modulation	16F3
Audio Sensitivity	160 mV ±3 dB for 3.0 kHz deviation at 1000 Hz
FM Hum & Noise	-70 dB below ±3.0 kHz deviation at 1000 Hz (−55 dB for base station models)
Audio Response	+1, -3 dB from 6 dB/octave pre-emphasis (300 to 3000 Hz)
Audio Distortion	Less than 3%

*Per EIA specification RS-152B, paragraph 4.

RECEIVER

Channel Spacing	25 kHz
Selectivity - EIA SINAD	-85 dB at ±25 kHz
Intermodulation - EIA SINAD	-80 dB
EIA Modulation Acceptance	±7 kHz
Sensitivity	0.4 uV or less for 20 dB quieting 0.3 uV or less for 12 dB SINAD.
Frequency Stability	±0.0005%; -30°C to +60°C (+25°C reference)
Spurious & Image Rejection	Greater than 100 dB
Squelch Threshold Sensitivity	Less than 0.2 uV
Audio Output	3 watts, with less than 5% distortion
Audio Response	+2, -8 dB from 6 dB/octave de-emphasis (300-3000 Hz)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

FCC TRANSMITTER LICENSE DESIGNATIONS

Freq. Range (MHz)	Freq. Stability (%)	Single Frequency	Two Frequency	Four Frequency
450-470 MHz	.0005	CC4280	CC4281	CC4284
	.0002	CC4280(C)	CC4281(C)	
470-494	.0005	CC4280-1	CC4281-1	CC4284-1
	.0002	CC4280-1(C)	CC4281-1(C)	
494-512	.0005	CC4280-2	CC4281-2	CC4284-2
	.0002	CC4280-2(C)	CC4281-2(C)	

FCC RECEIVER CERTIFICATION NUMBERS

Single Freguency: RCO208
Two Frequency: RCO209
Four Frequency: RCO210

Ⓜ, Maxar-80, Maxar, Private-Line, Digital Private-Line, and Quik-Call II are trademarks of Motorola Inc.

SPECIFICATIONS FOR *MAXAR-80* 2 W/3 W LOW POWER INDUSTRIAL RADIO

GENERAL

	Transmit	Receive	Standby (Squelched)
Maximum Battery Drain at 13.8 V	1.5 Amp	1 Amp	0.3 Amp
Base Station Primary Power at 120 V AC 60 Hz	40 Watts		8 Watts
Frequency Range	450-470 MHz		
Dimensions (Mobile)	2-3/8" H x 6-1/2" W x 10-1/4" D (59mm H x 165mm W x 260mm L)		
Weight (Mobile)	4.8 lbs. (2180gm)		
Dimensions (Base)	3-1/4" H x 6-3/4" W x 10-1/4" L (81mm H x 171mm W x 260 mm L)		
Weight (Base) (Power Supply Included)	17 lbs. (7718 gm)		

TRANSMITTER

RF Power Output	2 Watts**
Spurious & Harmonic Emmissions*	70 dB below carrier
Output Impedance	50 ohms
Frequency Stability	±0.0005%; −30°C to + 60°C (+25°C reference) ±0.0002% (Optional one or two frequency base models only)
Modulation	16F3
Audio Sensitivity	160 mV ±3 dB for 3.0 kHz deviation at 1000 Hz
FM Hum & Noise	-70 dB below ±3.0 kHz deviation at 1000 Hz
Audio Response	+1, -3 dB from 6 dB/octave pre-emphasis (300 to 3000 Hz)
Audio Distortion	Less than 3%

*Per EIA specification RS-152B, paragraph 4.
**3-watt power option B329 available.

RECEIVER

Channel Spacing	25 kHz
Selectivity - EIA SINAD	-85 dB at ±25 kHz
Intermodulation - EIA SINAD	-80 dB
EIA Modulation Acceptance	±7 kHz
Sensitivity	0.40 uV or less for 20 dB quieting 0.3 uV or less for 12 dB SINAD.
Frequency Stability	±0.0005%; -30°C to +60°C (+25°C reference)
Spurious & Image Rejection	Greater than 100 dB
Squelch Threshold Sensitivity	Less than 0.2 uV
Audio Output	6 watts, with less than 5% distortion (Spkr/Amp)
Audio Response	+2, -8 dB from 6 dB/octave de- emphasis (300-3000 Hz)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

FCC TRANSMITTER LICENSE DESIGNATIONS

Freq. Range (MHz)	Freq. Stability (%)	Single Frequency	Two Frequency	Four Frequency
450-470 MHz	.0005	CC4319	CC4320	CC4321
	.0002	CC4319C	CC4320C	

FCC RECEIVER CERTIFICATION NUMBERS

Single Frequency: RC0208
Two Frequency: RC0209
Four Frequency: RC0210

MODEL CHART
FOR
MAXAR-80
FM TWO-WAY RADIO
450-512 MHz
30/25 W RF POWER
ONE AND TWO FREQUENCY
+ 12 V DC MOBILE
117 V AC BASE STATION

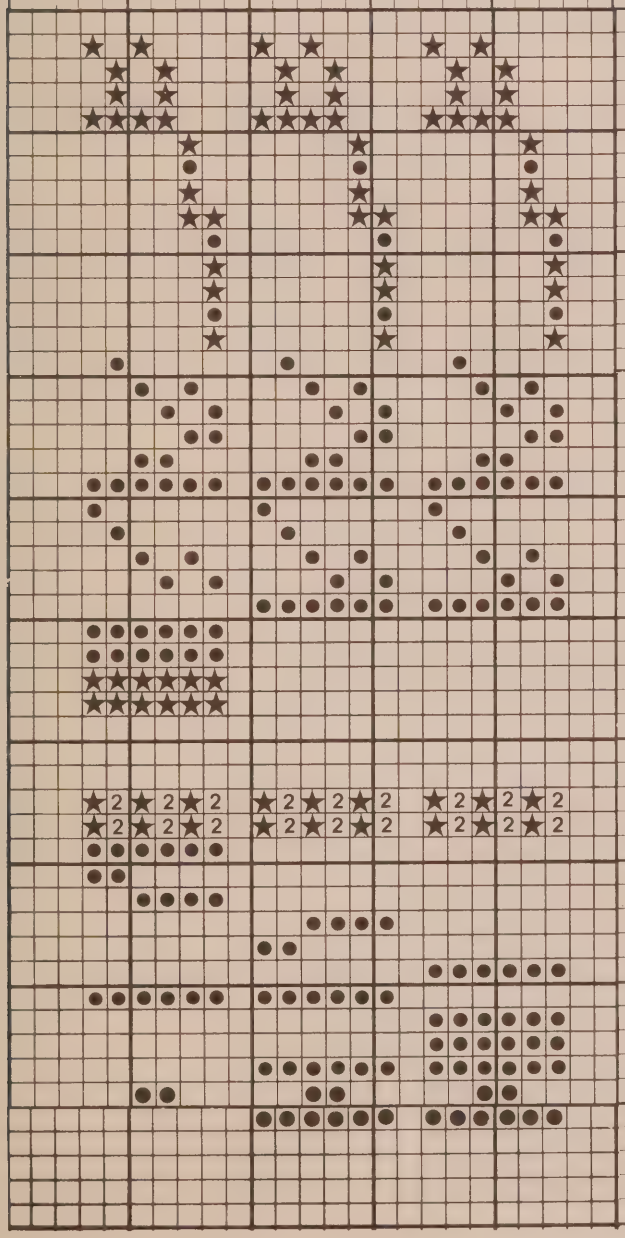
CODE:

● = ONE ITEM SUPPLIED

★ = ONE ITEM SUPPLIED, DEPENDENT ON FREQUENCY

2 = NUMBER INDICATES QUANTITY SUPPLIED, DEPENDENT ON FREQUENCY

ITEM	NUMBER OF OPERATING FREQUENCIES	SQUELCH
MOBILE MODELS		
D34TSA1000AK	1	CARRIER
D34TSA1300AK	2	CARRIER
D34TSA3000BK	1	*PRIVATE-LINE*
D34TSA3300BK	2	*PRIVATE-LINE*
D34TSA6000AK	1	*DIGITAL PRIVATE-LINE*
D34TSA6300AK	2	*DIGITAL PRIVATE-LINE*
BASE STATION MODELS		
L44TSB1100AM	1	CARRIER
L44TSB1130AM	2	CARRIER
L44TSB3100BM	1	*PRIVATE-LINE*
L44TSB3130BM	2	*PRIVATE-LINE*
L44TSB6100AM	1	*DIGITAL PRIVATE-LINE*
L44TSB6130AM	2	*DIGITAL PRIVATE-LINE*
PAGING BASE STATION MODELS		
L44TSB1105AM	1	CARRIER
L44TSB1135AM	2	CARRIER
L44TSB3105BM	1	*PRIVATE-LINE*
L44TSB3135BM	2	*PRIVATE-LINE*
L44TSB6105AM	1	*DIGITAL PRIVATE-LINE*
L44TSB6135AM	2	*DIGITAL PRIVATE-LINE*



ITEM	DESCRIPTION
TUE1563AB	UNIFIED CHASSIS (450-470 MHz) 1-FREQ.
TUE1563BH	UNIFIED CHASSIS (450-470 MHz) 2-FREQ.
TUE1564BH	UNIFIED CHASSIS (470-490 MHz) 2-FREQ.
TUE1565BH	UNIFIED CHASSIS (490-512 MHz) 2-FREQ.
TUE1793AB	UNIFIED CHASSIS (450-470 MHz) 1-FREQ. DPL SQUELCH
TRN6207A	DIGITAL *PRIVATE-LINE* ENCODER/DECODER
TUE1563AB	UNIFIED CHASSIS (450-470 MHz) 1-FREQ.
TUE1794AH	UNIFIED CHASSIS (470-490 MHz) 2-FREQ. DPL SQUELCH
TRN6207A	*DIGITAL PRIVATE-LINE* ENCODER/DECODER
TUE1564BH	UNIFIED CHASSIS (470-490 MHz) 2-FREQ.
TUE1795AH	UNIFIED CHASSIS (490-512 MHz) 2-FREQ. DPL SQUELCH
TRN6207A	*DIGITAL PRIVATE-LINE* ENCODER/DECODER
TUE1565BH	UNIFIED CHASSIS (490-512 MHz) 2-FREQ.
TRN6206A	HARDWARE FOR 2-FREQ., CARRIER SQUELCH
TRN6204A	HARDWARE FOR 1-FREQ., *PRIVATE-LINE* SQUELCH
TRN6205A	HARDWARE FOR 2-FREQ., *PRIVATE-LINE* SQUELCH
TRN6005A	CODE PLUG, *DIGITAL PRIVATE-LINE* SQUELCH
TRN4237A	PL ENCODER/DECODER BOARD
THN6347A	HOUSING
TRN8427A	ESCUTCHEON FOR 1-FREQ., CARRIER SQUELCH
TRN8429A	ESCUTCHEON FOR 2-FREQ., CARRIER SQUELCH
TRN8428A	ESCUTCHEON FOR 1-FREQ., "MONITOR"
TRN8430A	ESCUTCHEON FOR 2-FREQ., "MONITOR"
TPN1154A	AC POWER SUPPLY
TKN6992A	POWER CABLE (MOBILE)
TLN5992A	MOBILE INSTALLATION KIT (LOCKING TRUNNION)
TAE6052A	ANTENNA, 450-470 MHz (UNITY GAIN)
TAE6054A	ANTENNA, 470-512 MHz (UNITY GAIN)
TAE6062A	ANTENNA, 450-470 MHz 5.0 dB GAIN (OPTIONAL)
TAE6064A	ANTENNA, 470-490 MHz 5.0 dB GAIN (OPTIONAL)
TAE6065A	ANTENNA, 490-512 MHz 5.0 dB GAIN (OPTIONAL)
KXN6121AA	CRYSTAL, XMTR
KXN6122AA	CRYSTAL, RECEIVER
TMN6134B	MICROPHONE MOBILE
TLN4839A	MICROPHONE HANG-UP KIT
TRN6283A	PL MICROPHONE HANG-UP KIT
TMN1021B/C	DESK MICROPHONE, CARRIER SQUELCH
TMN1022B/C	DESK MICROPHONE, *PRIVATE-LINE* SQUELCH
TKN6995A	CABLE INTERFACE PAGING BASE
TRN6933A	HEATER, 5 PPM
TMN1018B/C	DESK MICROPHONE, PAGING BASE
TRN6934A	HEATER, 2 PPM
TRN8496A	TRAY BASE
TRN4224A	CODE PLUG, *PRIVATE-LINE* SQUELCH
TKN6949A	POWER CABLE, BASE

EPS-26313-D

UNIFIED CHASSIS
BREAKDOWN CHART
FOR
MAXAR-80
FM TWO-WAY RADIO
450-512 MHz
30/25 W RF POWER
ONE AND TWO FREQUENCY

CODE:

● = ONE ITEM SUPPLIED

ITEM	DESCRIPTION	TUE1563AB	TUE1565AB	TUE1563BH	TUE1564BH	TUE1565BH
	UNIFIED CHASSIS, 1-FREQ. (450-470 MHz)	●				
	UNIFIED CHASSIS, 1-FREQ.(490-512 MHz)		●			
	UNIFIED CHASSIS, 2-FREQ. (450-470 MHz)			●		
	UNIFIED CHASSIS, 2-FREQ. (470-490 MHz)				●	
	UNIFIED CHASSIS, 2-FREQ. (490-512 MHz)					●
TLE1833A	POWER AMPLIFIER	●		●		
TLE1834A	POWER AMPLIFIER				●	
TLE1835A	POWER AMPLIFIER		●			●
TLE1843A	RF DECK	●		●		
TLE1844A	RF DECK				●	
TLE1845A	RF DECK		●			●
TLE4003A	MAIN CIRCUIT BOARD	●				
TLE4004A	MAIN CIRCUIT BOARD				●	
TLE4005A	MAIN CIRCUIT BOARD		●			
TLE4013B	MAIN CIRCUIT BOARD			●		
TLE4014B	MAIN CIRCUIT BOARD				●	
TLE4015B	MAIN CIRCUIT BOARD					●
TRN6846A	HARDWARE, MAIN CIRCUIT BOARD	●	●	●	●	●

EPS-26314-B

MODEL CHART
FOR
MAXAR-80
FM TWO-WAY RADIO
450-512 MHz
30/25 W RF POWER
FOUR-FREQUENCY
+ 12 V DC MOBILE
117 V AC BASE STATION

CODE:

● = ONE ITEM SUPPLIED

★ = ONE ITEM SUPPLIED, DEPENDENT ON FREQUENCY

4 = NUMBER INDICATES QUANTITY SUPPLIED, DEPENDENT ON FREQUENCY

ITEM	NUMBER OF OPERATING FREQUENCIES	SQUELCH	D34TSA1900AK	D34TSA3900BK	D34TSA6900AK	L44TSB1190AM	L44TSB3190BM	L44TSB6190AM
	MOBILE MODELS		4	4	4	4	4	4
			CARRIER	*PRIVATE-LINE*	*DIGITAL PRIVATE-LINE*	CARRIER	*PRIVATE-LINE*	*DIGITAL PRIVATE-LINE*
	BASE-STATION MODELS							
TUE1563BH	UNIFIED CHASSIS (450-470 MHz)		★	★		★	★	
TUE1564BH	UNIFIED CHASSIS (470-490 MHz)		★	★		★	★	
TUE1565BH	UNIFIED CHASSIS (490-512 MHz)		★	★		★	★	
TUE1793AB	UNIFIED CHASSIS (450-470 MHz) DPL SQUELCH				★			★
TRN6207A	*DIGITAL PRIVATE-LINE* ENCODER/DECODER				●			●
TUE1563AB	UNIFIED CHASSIS (450-470 MHz)				★			★
TUE1794AH	UNIFIED CHASSIS (470-490 MHz) DPL SQUELCH				★			★
TRN6207A	*DIGITAL PRIVATE-LINE* ENCODER/DECODER				●			●
TUE1564BH	UNIFIED CHASSIS (470-512 MHz)				★			★
TUE1795AH	UNIFIED CHASSIS (490-512 MHz) DPL SQUELCH				★			★
TRN6207A	*DIGITAL PRIVATE-LINE* ENCODER/DECODER				●			●
TUE1565BH	UNIFIED CHASSIS (490-512 MHz)				★			★
TRN8782A	HARDWARE KIT CARRIER SQUELCH					●		
TRN8783A	HARDWARE *PRIVATE-LINE* SQUELCH		●	●			●	●
TRN6005A	CODE PLUG, *DIGITAL PRIVATE-LINE* SQUELCH				●			●
TRN4237A	PL ENCODER/DECODER BOARD		●				●	
THN6369A	HOUSING		●	●	●	●	●	●
TRN8465A	ESCUTCHEON		●	●	●	●	●	●
TPN1154A	AC POWER SUPPLY					●	●	●
TKN6992A	POWER CABLE (MOBILE)		●	●	●			
TLN5992A	MOBILE INSTALLATION KIT (LOCKING TRUNNION)		●	●	●			
TAE6052A	ANTENNA UNITY GAIN 450-470 MHz		★	★	★			
TAE6054A	ANTENNA UNITY GAIN 470-512 MHz		★	★	★			
TAE6062A	ANTENNA, 450-470 MHz 5.0 dB GAIN (OPTIONAL)							
TAE6064A	ANTENNA, 470-490 MHz 5.0 dB GAIN (OPTIONAL)							
TAE6065A	ANTENNA, 490-512 MHz 5.0 dB GAIN (OPTIONAL)							
KXN6121AA	CRYSTAL XMTR		4	4	4	4	4	4
KXN6122AA	CRYSTAL RECEIVER		4	4	4	4	4	4
TMN6134B	MICROPHONE MOBILE		●	●	●			
TLN4839A	MICROPHONE HANG-UP KIT		●					
TRN6284A	PL MICROPHONE HANG-UP KIT			●	●			
TMN1021B/C	DESK MICROPHONE, CARRIER SQUELCH					●		
TMN1022B/C	DESK MICROPHONE, *PRIVATE-LINE* SQUELCH						●	●
TRN6933A	HEATER, 5 PPM		●	●	●	●	●	●
TRN8496A	TRAY BASE					●	●	●
TSN6030B	SPEAKER		●	●	●	●	●	●
TLE5193A	FOUR-FREQUENCY BOARD (450-470 MHz)		★	★	★	★	★	★
TLE5194A	FOUR-FREQUENCY BOARD (470-494 MHz)		★	★	★	★	★	★
TLE5195A	FOUR-FREQUENCY BOARD (494-512 MHz)		★	★	★	★	★	★
TKN6949A	POWER CABLE (BASE STATION)					●	●	●
TRN4224A	CODE PLUG, *PRIVATE-LINE* SQUELCH			●			●	
TKN6949A	POWER CABLE, BASE					●	●	●

EPS-28377-C

UNIFIED CHASSIS BREAKDOWN CHART FOR *MAXAR-80* FM TWO-WAY RADIO 450-512 MHz 30/25 W RF POWER FOUR-FREQUENCY

CODE:

● = ONE ITEM SUPPLIED

ITEM	DESCRIPTION	TUE1563BH	TUE1564BH	TUE1565BH	TUE1563AB
	UNIFIED CHASSIS 4-FREQUENCY (450-470 MHz)				●
	UNIFIED CHASSIS 4-FREQUENCY (470-490 MHz)		●		
	UNIFIED CHASSIS 4-FREQUENCY (490-512 MHz)			●	
	UNIFIED CHASSIS 4-FREQUENCY (450-470 MHz)	●			●
TLE1833A	POWER AMPLIFIER	●			●
TLE1834A	POWER AMPLIFIER		●		
TLE1835A	POWER AMPLIFIER			●	
TLE1843A	RF DECK	●			●
TLE4023A	RF AMPLIFIER BOARD	●	●	●	
TLE4033A	RF DECK	●			
TRN6847A	MIXER BOARD	●	●	●	
TLE1844A	RF DECK		●		
TLE4034A	RF DECK		●		
TLE1845A	RF DECK			●	
TLE4035A	RF DECK			●	
TLE4013B	MAIN CIRCUIT BOARD	●			
TLE4014B	MAIN CIRCUIT BOARD		●		
TLE4015B	MAIN CIRCUIT BOARD			●	
TLE4003A	MAIN CIRCUIT BOARD				●
TRN6846A	HARDWARE, MAIN CIRCUIT BOARD	●	●	●	●

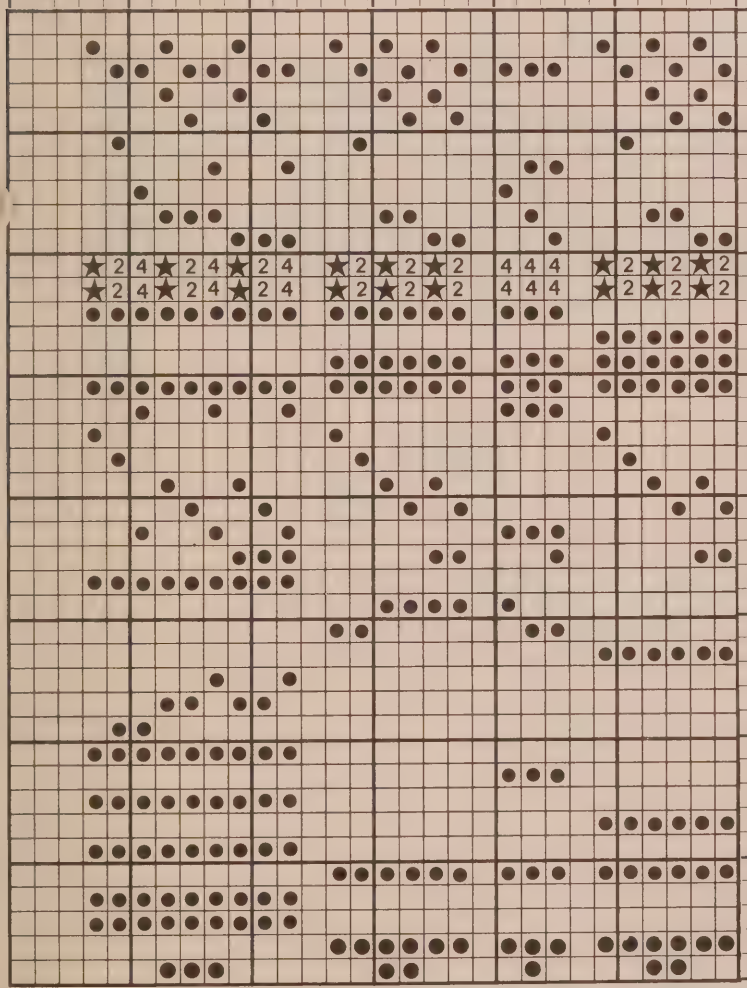
EPS-28376-B

MODEL CHART
FOR
MAXAR-80 L.P.I.
FM TWO-WAY RADIO
450-470 MHz
2 W/3 W RF POWER
ONE, TWO, AND FOUR FREQUENCY
+ 12 V DC MOBILE
117 V AC BASE STATION

CODE:

- ● = ONE ITEM SUPPLIED WITH EACH RADIO
- ★ = ONE ITEM SUPPLIED WITH EACH RADIO, DEPENDENT UPON FREQUENCY
- 4 = NUMBER INDICATES QUANTITY SUPPLIED, WITH EACH RADIO DEPENDENT UPON FREQUENCY

MODEL NUMBER	NUMBER OF OPERATING FREQUENCIES	TYPE OF SQUELCH
MOBILE MODELS		
D04TSA1000AK	1	CARRIER
D04TSA1300AK	2	CARRIER
D04TSA1900AK	4	CARRIER
D04TSA3000BK	1	*PRIVATE-LINE*
D04TSA3300BK	2	*PRIVATE-LINE*
D04TSA3900BK	4	*PRIVATE-LINE*
D04TSA6000AK	1	*DIGITAL PRIVATE-LINE*
D04TSA6300AK	2	*DIGITAL PRIVATE-LINE*
D04TSA6900AK	4	*DIGITAL PRIVATE-LINE*
CONTROL/BASE STATION MODELS		
L24TSB1100AM	1	CARRIER
L24TSB1130AM	2	CARRIER
L24TSB3100BM	1	*PRIVATE-LINE*
L24TSB3130BM	2	*PRIVATE-LINE*
L24TSB6100AM	1	*DIGITAL PRIVATE-LINE*
L24TSB6130AM	2	*DIGITAL PRIVATE-LINE*
CONTROL STATION MODELS		
L24TSB1190AM	4	CARRIER
L24TSB3190BM	4	*PRIVATE-LINE*
L24TSB6190AM	4	*DIGITAL PRIVATE-LINE*
PAGING BASE STATION MODELS (NOTE 1)		
L24TSB1105AM	1	CARRIER
L24TSB1135AM	2	CARRIER
L24TSB3105BM	1	*PRIVATE-LINE*
L24TSB3135BM	2	*PRIVATE-LINE*
L24TSB6105AM	1	*DIGITAL PRIVATE-LINE*
L24TSB6135AM	2	*DIGITAL PRIVATE-LINE*



ITEM	DESCRIPTION
TUE1583AB	UNIFIED CHASSIS (450-470 MHz) 1-FREQ.
TUE1583BH	UNIFIED CHASSIS (450-470 MHz) 2-FREQ.
TRN6204A	HARDWARE FOR 1-FREQ.; *PRIVATE-LINE*
TRN6205A	HARDWARE FOR 2-FREQ.; *PRIVATE-LINE*
TRN6206A	HARDWARE FOR 2-FREQ.; CARRIER SQUELCH
TRN8783A	HARDWARE FOR 4-FREQ.; *PRIVATE-LINE* & *DIGITAL PRIVATE-LINE*
TRN8782A	HARDWARE FOR 4-FREQ.; CARRIER SQUELCH
TRN4237A	PL ENCODER/DECODER BOARD
TRN6207A	DPL SQUELCH ENCODER BOARD
KXN6121AA	TRANSMITTER CRYSTAL
KXN6122AA	RECEIVER CRYSTAL
TRN6933A	HEATER, 5 PPM
TRN6934A	HEATER, 2 PPM
TPN1136A	POWER SUPPLY, 110 V
THN6369A	HOUSING, COMPATIBLE *QUIK-CALL II*
TLE5193A	4-FREQ. OSCILLATOR MODULATOR BOARD
TRN8427A	ESCUTCHEON FOR 1-FREQ.; CARRIER SQUELCH
TRN8429A	ESCUTCHEON FOR 2-FREQ.; CARRIER SQUELCH
TRN8428A	ESCUTCHEON FOR 1-FREQ.; *PRIVATE-LINE* SQUELCH
TRN8430A	ESCUTCHEON FOR 2-FREQ.; *PRIVATE-LINE* SQUELCH
TRN8465A	ESCUTCHEON FOR 4-FREQ.
TRN6005A	CODE PLUG, *DIGITAL PRIVATE-LINE* SQUELCH
TMN6134A/B	MOBILE MICROPHONE
TMN1021B/C	DESK MICROPHONE, CARRIER SQUELCH
TMN1022B/C	DESK MICROPHONE *PRIVATE-LINE* SQUELCH
TMN1018B/C	DESK MICROPHONE, W/LUG *PRIVATE-LINE* SQUELCH
TRN6284A	MICROPHONE HANG-UP BOX W/SWITCH
TRN6283A	PL HANG-UP BOX
TLN4839A	MICROPHONE HANG-UP KIT
TLN5992A	INSTALLATION KIT
TSN6030B	MOBILE SPEAKER
TKN6992A	POWER CABLE, MOBILE
TKN6995A	INTERFACE CABLE
TAE6025A	ROOF TOP ANTENNA
TRN8596A	BASE TRAY
TSN1003A	SPEAKER/AMPLIFIER
TLN2234A	SPKR/AMP 8' CABLE W/PIN EXTENDERS
TKN6949A	POWER CABLE, BASE
TRN4224A	CODE PLUG, *PRIVATE-LINE* SQUELCH

EPS-28594-C

NOTE:

1. FOR OPERATION ON L24TSB SERIES PAGING BASE STATION MODELS, REFER TO PAGING BASE STATION SUPPLEMENT 68P81033E80.

UNIFIED CHASSIS BREAKDOWN CHART FOR *MAXAR-80* L.P.I. FM TWO-WAY RADIO 450-470 MHz 2 W/3 W RF POWER ONE, TWO, AND FOUR-FREQUENCY

CODE:

● = ONE ITEM SUPPLIED

ITEM	DESCRIPTION
TUE1583AB	UNIFIED CHASSIS (450-470 MHz)1-FREQ.
TUE1583BH	UNIFIED CHASSIS (450-470 MHz)2-FREQ.

ITEM	DESCRIPTION	TUE1583AB	TUE1583BH
TLE1813A	POWER AMPLIFIER, 2 W	●	●
TLE8953A	POWER AMPLIFIER BOARD	●	●
TRN6827A	POWER AMPLIFIER HARDWARE KIT	●	●
TLE1843A	RF DECK	●	●
TLE4023A	RF AMPLIFIER BOARD	●	●
TLE4033A	RF DECK	●	●
TRN6847A	MIXER BOARD	●	●
TLE4003A	MAIN BOARD	●	
TLE4013B	MAIN BOARD		●
TRN8407A	SENSING RESISTOR, 2 W	●	●
TRN6846A	MAIN BOARD HARDWARE KIT	●	●

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Radio Set Internal Options Table

Option Number	Kit Number	Description	Reference Publication
B96BJ	TRN8433A	Inverted Escutcheon, 1-Freq. Carrier Squelch	Note 1
B96BK	TRN8435A	Inverted Escutcheon, 2-Freq. Carrier Squelch	Note 1
B96BL	TRN8434A	Inverted Escutcheon, 1-Freq. PL or DPL Squelch	Note 1
B96BM	TRN8436A	Inverted Escutcheon, 2-Freq. PL or DPL Squelch	Note 1
B96CE	TRN8466A	Inverted Escutcheon, 4-Frequency	Note 1
B561	Note 2	*Quik-Call II*; Individual, Carrier Squelch	68P81038E25
B562	Note 2	*Quik-Call II*; Individual, Carrier Squelch, Horn & Light	68P81038E25
B563	Note 2	*Quik-Call II*; Group, Carrier Squelch, Horn & Light	68P81038E25
B162	Note 2	*Quik-Call II*; Individual, PL and DPL Squelch	68P81038E15
B163	Note 2	*Quik-Call II*; Individual, PL and DPL Squelch, Horn & Light	68P81038E15
B164	Note 2	*Quik-Call II*; Group, PL and DPL, Horn & Light	68P81038E15
B165	Note 2	*Quik-Call II*; Extended Tone "B" Group	68P81038E15
B589	Note 2	Public Address with Speaker Amplifier	68P81109E23
B330	Note 2	Public Address without Speaker Amplifier	68P81109E23
B549	Note 2	Public Address Speaker Amplifier	68P81109E22
B262	Note 2	Multiple *Digital Private-Line* Squelch	68P81109E25
B270	Note 2	Status/Message Terminal Interface	68P81109E27
B11	TRN8618A	Time-Out Timer	68P81109E26

Radio Set External Options Table

Option Number	Kit Number	Description	Reference Publication
B62	TRN6524A	Security Screws	Note 3
B29	TRN6525A	Quick Mounting Screws	Note 3
B109	TMN6137A	Handset	68P81109E16
	TRN6319A	Handset Hang-up Box	68P81104E44
B18	TSN6030B	External Speaker (Standard on 4- Frequency Models)	68P81109E24
B95	TRN6284A	Hang-up Box with Switch for Models with B262 Option (Standard on 4- Frequency PL and DPL models)	68P81038E15 and Note 1

Note 1. Covered in this publication.
Note 2. Refer to reference publication.
Note 3. No coverage required.

OPERATING INSTRUCTIONS

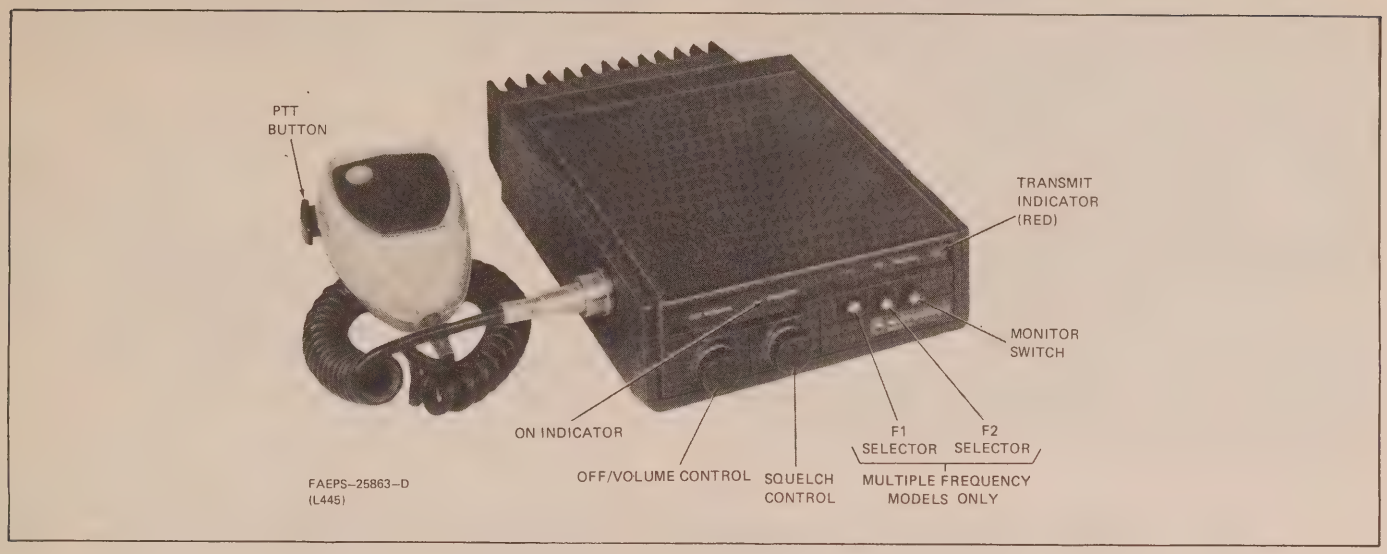

Figure 1.
Operating Controls and Indicators

1. TO TURN ON RADIO

The on-off switch for the radio set is operated by the OFF-VOLUME control. To turn on the radio set, rotate the OFF-VOLUME control knob clockwise until a click is heard. The front panel lamps then turn on to illuminate the control labels and the green ON indicator.

NOTE

When operating in extremely cold ambient temperature conditions (-10 to -30°C), allow 2 minutes after radio is turned on before transmitting to ensure compliance with FCC rules and regulations.

2. TO RECEIVE

Operation	Procedure
1. Disable PL (PL Models only)	Press MONITOR button so it stays in. -OR- Remove microphone from hangup box (mandatory if radio is not equipped with monitor button)
2. Unsquelch radio	Turn SQUELCH control counter clockwise until noise is heard.
3. Set VOLUME control	Adjust VOLUME control for a comfortable listening level.
4. Set SQUELCH control	Turn SQUELCH control clockwise until noise just stops.
5. Select operating frequency. (Two- or four-frequency models only)	Press the desired frequency select button. On four-frequency models the F3 select button replaces the MONITOR button and the F4 select button is mounted to the right of the F3 select button.
The radio is now adjusted to receive *all* messages on the selected frequency.	
6. Enable PL (PL models only)	Press MONITOR button and allow it to return to the "out" position. -OR- If radio uses a microphone hangup box, insert microphone into its hanger.
You are now able to hear messages for your system only.	

3. TO TRANSMIT

3.1 MOBILE RADIOS

Operation	Procedure
1. Disable PL (PL models only)	Press MONITOR button so it stays in. -OR- Remove microphone from hangup box (mandatory if radio is not equipped with monitor button).
2. Select operating frequency (Two- or four-frequency models only)	Press the desired frequency select button. On four-frequency models the F3 select button replaces the MONITOR button and the F4 select button is mounted to the right of the F3 select button.
3. LISTEN	DO NOT TRANSMIT if anyone is using the channel.
4. Key transmitter	Press and hold down microphone PTT button. Red light on radio front panel will glow indicating that the transmitter is "on-the-air".
5. Transmit message	Hold microphone about 2 inches from your lips and speak slowly into microphone at a normal voice level. Shouting will not make your message easier to understand. Make each transmission as brief as possible.
6. Receive Reply	Release microphone PTT button.
7. Enable PL at end of conversation (PL models only)	Press MONITOR button and allow it to return to the "out" position. -AND- Insert microphone into its hanger.

3.2 BASE STATION RADIOS

Operation	Procedure
1. Select operating frequency (two- or four-frequency models only)	Press one of the frequency select buttons as needed.
2. Monitor the radio channel	Depress the microphone MONITOR switch.
3. Listen	Briefly listen for conversations on the radio channel.
4. Transmit the message	If the radio channel is not in use, depress and hold both the microphone MONITOR and TRANSMIT switches while speaking about 6 inches from the microphone. Speak distinctly and at a normal level. Release the TRANSMIT switch at the end of the message or to receive a reply.
5. Enable receiver muting (carrier squelch models)	At the end of the message or conversation release the microphone MONITOR switch.

NOTE

If JU2 is removed from the microphone (normal for paging base station to ensure that the operator monitors the channel) both the microphone transmit and monitor buttons must be pressed to transmit — releasing either switch ends the transmission.

PREINSTALLATION INSTRUCTIONS

1. UNPACKING

When unpacking the radio from its shipping carton, refer to the model chart at the front of this manual. If any item is missing, contact your Motorola representative immediately.

2. LICENSING REQUIREMENTS

FCC regulations state that a station license must be obtained for each radio installation (mobile or base) by the owner of the equipment. The station licensee is responsible for ensuring that the transmitter power, frequency, and deviation are within the limits permitted under the station license. Adjustments to the transmitter section of the radio may be made only by a technician possessing an FCC general class (or first or second class) radiotelephone operator's license. No license is required to install, or operate the radio.

3. BENCH CHECK

3.1 INTRODUCTION

Each radio set is adjusted, tested, and inspected before shipment. However, it is recommended that both the transmitter and receiver sections of the radio be checked for proper operation just prior to installation.

3.2 TESTING

The radio should be tested with all cables and accessories supplied with the radio connected as they will be in the final installation. The frequency, deviation, and output power of the transmitter should be checked, as well as the sensitivity, squelch operation, and audio quality of the receiver. Radios with PL or DPL capabilities should be operated in the coded squelch mode to verify proper encode/decode performance. Refer to the specifications page at the front of this manual to determine whether the radio is operating properly. Improper operation can generally be corrected by touching up the receiver or transmitter alignment.

4. INSTALLATION PLANNING-MOBILE RADIOS

4.1 GENERAL

Planning is the key to fast, easy radio installation. Before a hole is drilled or a wire is run, inspect the vehicle and determine how and where you intend to mount the antenna, radio set, and accessories. Plan wire and cable runs to provide maximum protection from pinching, crushing, and overheating.

4.2 ANTENNA MOUNTING

The best mounting location for the antenna is in the center of a large, flat conductive surface. In almost all vehicles these requirements are best satisfied by mounting the antenna at the center of the roof. Some vehicles have a large trunk lid that will provide a good antenna location. If the trunk lid is used, connect grounding straps between the trunk lid and vehicle chassis to insure that the trunk lid is at chassis ground.

4.3 RADIO MOUNTING

4.3.1 General

The trunnion mount allows the radio set to be mounted to a variety of surfaces. Be sure the mounting surface is able to adequately support the weight of the radio. Allow sufficient space around the radio for free air flow for cooling. Be sure the unit is close enough to the vehicle operator to permit easy access to operating controls while he is driving.

4.3.2 Inverted Escutcheon Installation

A front panel escutcheon with inverted lettering (Motorola Option B96) is available if you plan to mount the radio above the operator's normal line of sight. Install the inverted escutcheon as follows:

Step 1. Remove the ON/OFF VOLUME and SQUELCH control knobs.

Step 2. Remove the radio chassis from its housing (see Housing Removal procedure in SERVICE section).

Step 3. Using a long screwdriver, push on the back of the upright escutcheon until it is free of the radio housing front panel.

Step 4. Remove the tape from the back of the inverted escutcheon. Press the inverted escutcheon onto the radio housing front panel.

Step 5. Reinstall the radio chassis into the housing. Be sure the chassis locking tabs properly engage the slots in the housing. Replace the ON/OFF VOLUME and SQUELCH control knobs.

4.4 DC POWER AND WIRING

4.4.1 This radio must be operated *only* in negative-ground electrical systems. Reverse polarity will not damage the radio, but the cable fuse will blow. Check the vehicle ground polarity before you begin installation to prevent wasted time and effort.

4.4.2 Connect the red power lead through F601 to the vehicle battery positive terminal. Connecting the red lead to any other positive voltage point in the vehicle is *not recommended.*

CAUTION

If dc power is to be controlled by the vehicle ignition switch, a switching relay (Motorola Part No. 59-813674) should be used to switch the red power lead. The vehicle ignition switch, then, controls dc to the relay coil.

4.4.3 Connect the black power lead to a good ground point on the vehicle chassis. *Do not* connect the black lead directly to the battery negative terminal.

4.4.4 The wiring provided with the radio is of sufficient size to handle the maximum radio current demand. If wiring must be added to that provided, be sure the gauge of the added wire is sufficient for the current to be carried and length of the added run.

5. INSTALLATION PLANNING—BASE STATIONS

5.1 ANTENNA SYSTEM

Selecting the antenna system for your base radio depends on factors beyond the scope of this manual. Your Motorola representative can help you choose the antenna system that will best serve your particular needs.

5.2 RADIO LOCATION

Choose a location for your base radio as close as possible to where the antenna cable enters the building. Be sure 117 volt, 60 Hz power is available. Make sure sufficient air can flow around the radio to permit adequate cooling.

INSTALLATION INSTRUCTIONS

1. MOBILE RADIOS USING TLN5992A LOCKING TRUNNION

1.1 MOUNTING CONSIDERATIONS

Before attempting to install the locking trunnion examine the vehicle for suitable mounting locations. The bracket requires a flat mounting surface at least 8″ x 2″ with adequate clearance for inserting the radio set. The chosen location should also be convenient to the vehicle operator and provide access to power and antenna connections. Be careful to choose a location which permits the locking trunnion to be removed from the mounting bracket. Vehicle operation should in no case be impaired.

1.2 INSTALLATION

(Refer to Figure 2)

Step 1. Using the mounting bracket as a template, drill six 5/32-inch holes. If mounting on plastic surface, use metal backing plate to strenghten installation.

Step 2. Using the six #10-16 x 3/4" screws provided, attach the mounting bracket to the mounting surface. Allow 3/4 inch clearance in front of the bracket so locking trunnion may be inserted.

Step 3. Attach radio to locking trunnion using the two #10-32 x 1/2" screws provided in the radio.

Step 4. Insert the locking trunnion into the mounting bracket by first sliding the large flanges into the slots at the rear of the mounting bracket and then sliding the small locking flanges into the slots at the front of the mounting bracket.

Step 5. Lock the locking trunnion into the mounting bracket using the key provided.

Step 6. Perform Steps 2 through 9 in paragraph 2 below.

2. MOBILE RADIOS USING OPTIONAL TRUNNION MOUNTING BRACKET

Step 1. Mount the radio set trunnion mounting bracket. See Figure 3.

Step 2. Mount the antenna, using the instructions provided with the antenna kit. Run the coaxial cable to the intended radio set mounting location. If necessary, cut off the excess cable and install the cable connector.

CAUTION

DO NOT CUT ANTENNA CABLE unless absolutely necessary. If cable must be shortened, higher Effective Radiated Power will be obtained as per tabel below. Be sure the system is licensed to operate a higher ERP before cutting cable.

Step 3. Route power wiring, but do not make power connections and do not tie the wires down. Be sure to use grommets wherever the wiring must pass through a metal panel.

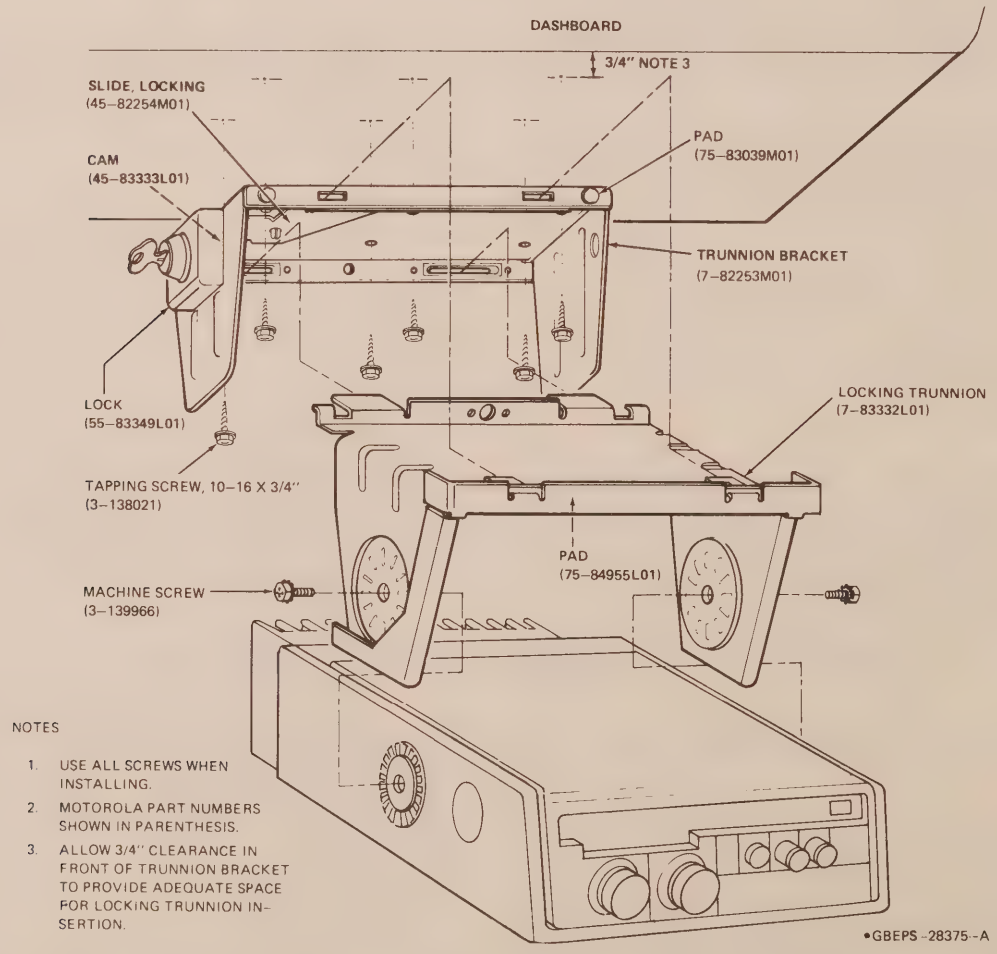

Figure 2.
Locking Trunnion Mounting

		FOR RADIO MODEL SERIES D34TSA				
	ANTENNA MODEL	Length of Cable Feet				
25 Watt		6	8	10	12	14
	TAE6054A	25 W ERP	23.5 W ERP	22 W ERP	21 W ERP	19.5 W ERP
	TAE6074, 5A (Optional)	56 W ERP	52.5 W ERP	49.5 W ERP	47 W ERP	43.5 W ERP
	TAE6094, 5B (Optional)	79 W ERP	74.5 W ERP	69.5 W ERP	66.5 W ERP	61.5 W ERP
30 Watt						
	TAE6054A	21 W ERP	19.5 W ERP	18.5 W ERP	17.5 W ERP	16.5 W ERP
	TAE6074, 5A (Optional)	47 W ERP	43.5 W ERP	41.5 W ERP	39 W ERP	37 W ERP
	TAE6094, 5B (Optional)	66.5 W ERP	61.5 W ERP	58.5 W ERP	55.5 W ERP	52 W ERP

Step 4. Mount the microphone hanger on microphone hang-up box.

Step 5. Connect the power plug and coaxial cable connector to the radio set. See Figure 4. Install the radio in the mounting bracket.

Step 6. Complete the power wire installation. Be sure to leave sufficient slack wire behind the radio set to make the unit easy to remove and reinstall. Strap the wire down where necessary being sure the wires do not make contact with hot areas on the engine. Be sure the wires cannot be snagged by the operator's feet or during the normal vehicle operation. Cut off the excess power lead length and attach the terminal lugs supplied.

Step 7. If a microphone hang-up box or external speaker is used, secure wiring to those items as needed. Allow sufficient slack in wiring for future maintenance.

Step 8. Connect the power leads. Be sure the connection points are clean and free of paint, dirt, and corrosion.

Step 9. Test radio and its accessories for proper system operation. Check the antenna SWR, using an in-line wattmeter.

NOTE

After installation, remove the protective film from the escutcheon. To remove any dust accumulation from the escutcheon, always wipe with a damp cloth.

3. BASE STATIONS

Step 1. Mount the radio set to the base mounting tray.

Step 2. Prepare radio set power leads as follows: Attach the provided pins to the ends of the red and black

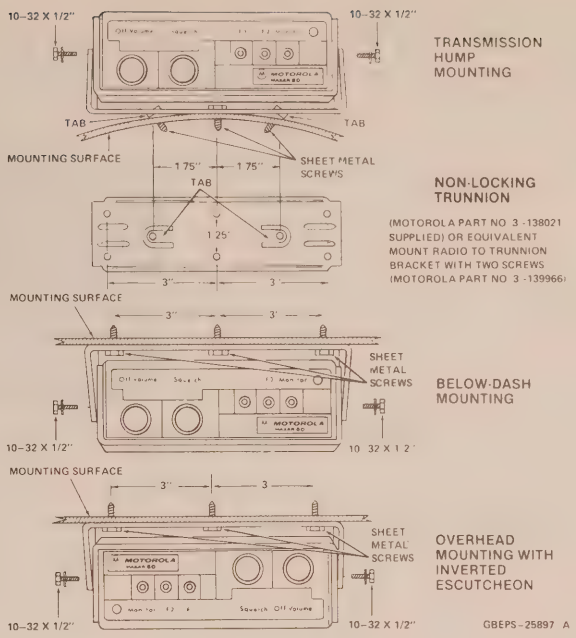

Figure 3.
Radio Mounting Detail

power leads. Insert power leads into the mating plug of the base station power supply output jack; red lead pin into position 4 and the black lead pin into position 1.

Step 3. Connect an in-line wattmeter between the radio antenna connector and the antenna system.

Step 4. Plug the base dc power supply into the 117 volt, 60 Hz outlet. Set the AC POWER switch on the power supply to the ON position.

Step 5. Key the transmitter and check the antenna system VSWR. If the VSWR is 3:1 or lower, disconnect the wattmeter and connect the antenna coaxial cable to the radio set antenna jack.

Step 6. Test the radio set and accessories for proper operation. A brief conversation with a mobile unit in your system will indicate whether the base station is operating satisfactorily.

NOTE

After installation, remove the protective film from the escutcheon. To remove any dust accumulation from the escutcheon, always wipe with a damp cloth.

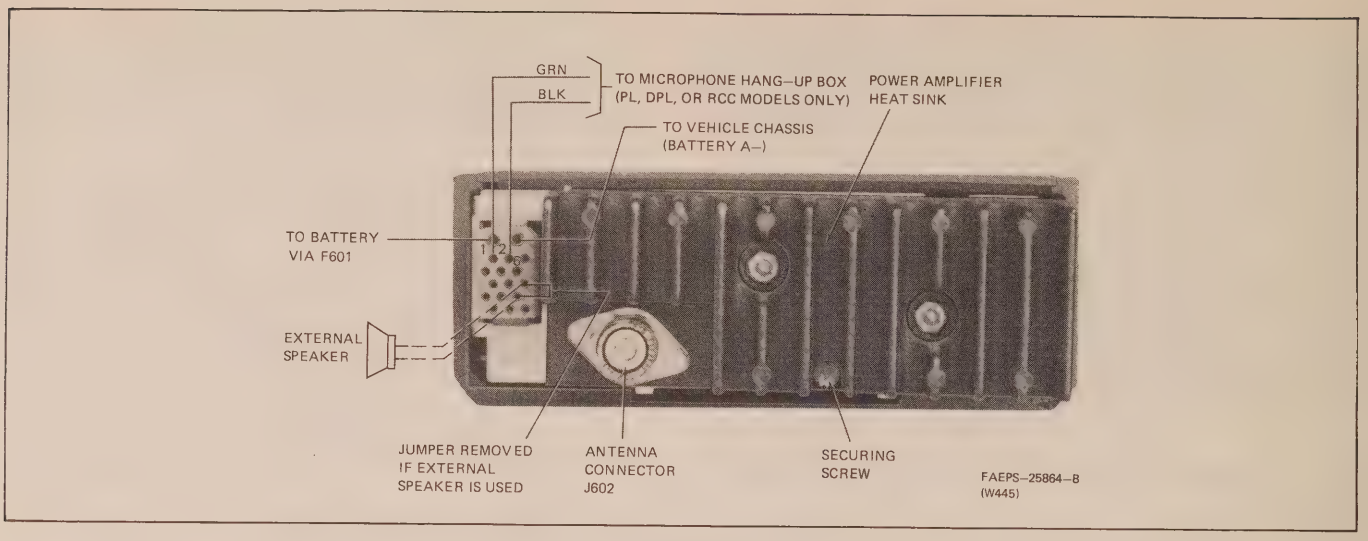

Figure 4.
Connections to Radio Set Rear Panel

SERVICE

1. INTRODUCTION

This radio is designed for easy servicing. All of the metering points are brought out to radio set power connector J601. For servicing information, refer to the schematic diagrams, circuit board details, and alignment procedures in this manual. Theory of operation is shown on the schematic diagrams.

2. HOUSING REMOVAL
(Refer to Figure 6)

Step 1. Remove the screws that hold the radio set in the trunnion mount.

Step 2. Remove the volume control and squelch control knobs, and disconnect the microphone.

Step 3. Insert a screwdriver blade into the screwdriver slot near the bottom of the radio chassis rear panel.

Step 4. Push the screwdriver against the housing until the chassis locking tabs clear the slots in the radio housing.

Step 5. Slide the radio chassis out the back of the housing.

3. WIRE REPLACEMENT—POWER PLUG P601

Two special wire extraction tools are available to remove wires from power plug P601; ST1145 for 0.062'' diameter pins (1-15); ST946 for 0.093'' diameter pins (A and B). This tool must be used for ease of wire extraction and to prevent damage to the connector or its pins.

4. FOUR-FREQUENCY BOARD REMOVAL

The four-frequency board requires removal for component access only. Adjustments may be made with the board in place.

Step 1. Pull the buttons off the frequency select switches.

Step 2. Remove the four screws on the board, and the two screws on either side of the frequency select switches.

Step 3. Press F4 to allow added clearance and raise the rear of the board at least 3/4'' and move board toward rear of radio until the switches are clear of the front panel. Lift the board out for access.

CAUTION
Be extremely careful not to catch coil L905 on the center support bracket of the radio.

Reverse the above procedure for reassembly.

5. MICROPHONE CONNECTOR REPAIR

5.1 GENERAL

When a mechanical or electrical failure occurs, the microphone connector can be easily disassembled for repairs as explained below.

5.2 DISASSEMBLY
(Refer to Figure 5.)

Step 1. While holding the microphone connector at the rear of its housing (the end with the strain relief spring), simultaneously twist and push the retaining collar away from the plug towards the cable.

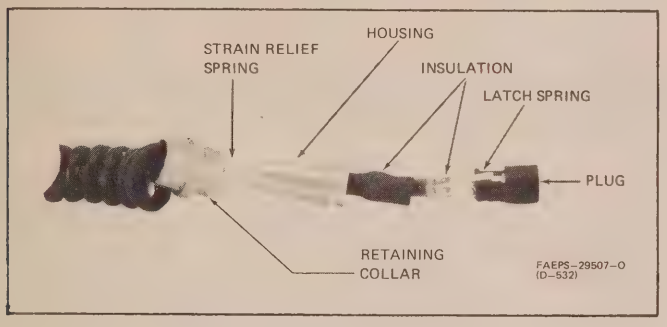

Figure 5. Microphone Connector

Step 2. Depress the latch spring that protrudes through the slot at the front of the connector housing, and separate the housing and strain relief from the plug to expose all the connections.

Step 3.Perform the required repairs.

5.3 RE-ASSEMBLY

Step 1. Once the required repairs are made, inspect the unit and replace all the heat shrink insulation.

Step 2. Re-assemble the unit by drawing the housing over the plug until the latch spring clicks into position. Slide the retaining collar into its original position.

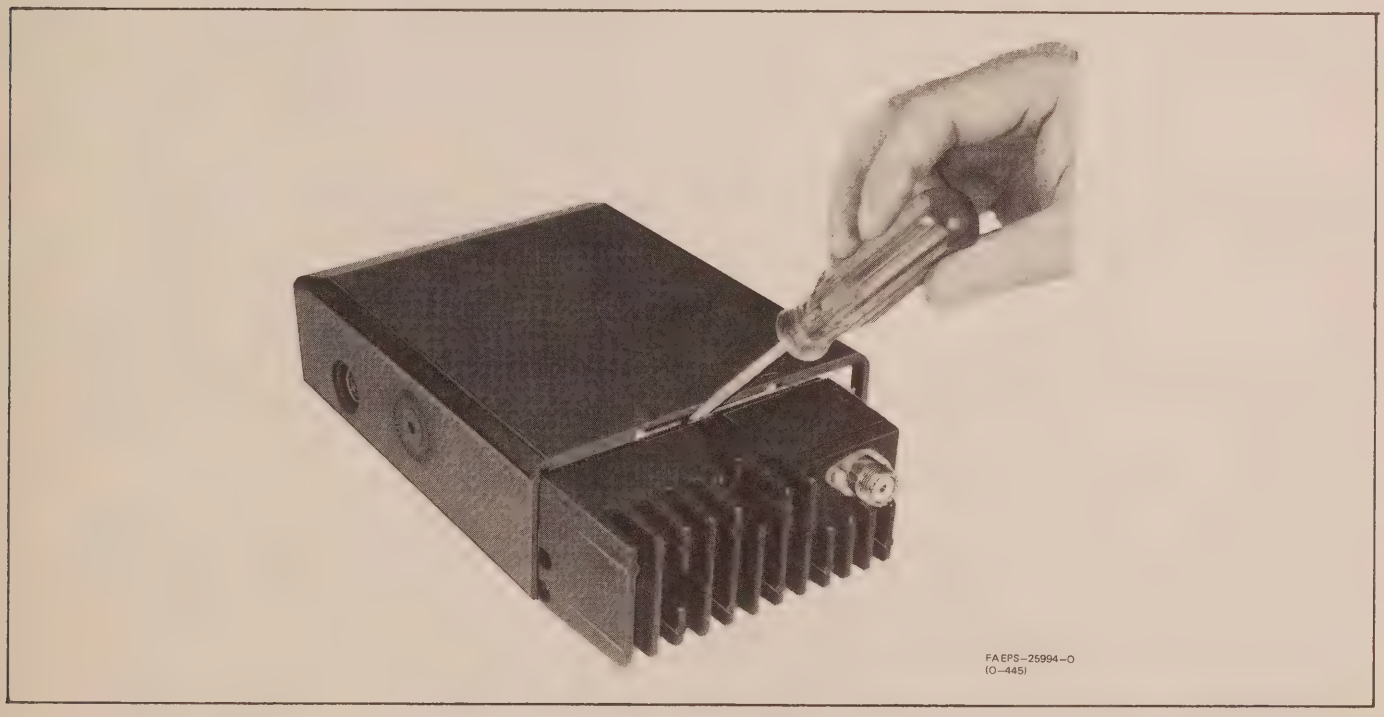

Figure 6. Housing Removal

MOTOROLA INC.
Communications
Sector

SAFE HANDLING OF CMOS INTEGRATED CIRCUIT DEVICES

Many of the integrated circuit devices used in communications equipment are of the CMOS (Complementary Metal Oxide Semiconductor) type. Because of their high open circuit impedance, CMOS ICs are vulnerable to damage from static charges. Care must be taken in handling, shipping, and servicing them and the assemblies in which they are used.

Even though protection devices are provided in CMOS IC inputs, the protection is effective only against overvoltage in the hundreds of volts range such as are encountered in an operating system. In a system, circuit elements distribute static charges and load the CMOS circuits, decreasing the chance of damage. *However, CMOS circuits can be damaged by improper handling of the modules even in a system.*

To avoid damage to circuits, observe the following handling, shipping, and servicing precautions.

1. Prior to and while servicing a circuit module, particularly after moving within the service area, momentarily touch *both* hands to a bare metal earth grounded surface. This will discharge any static charge which may have accumulated on the person doing the servicing.

NOTE
Wearing Conductive Wrist Strap (Motorola No. RSX-4015A) will minimize static buildup during servicing.

WARNING
When wearing Conductive Wrist Strap, be careful near sources of high voltage. The good ground provided by the wrist strap will also increase the danger of lethal shock from accidentially touching high voltage sources.

2. Whenever possible, avoid touching any electrically conductive parts of the circuit module with your hands.

3. Normally, circuit modules can be inserted or removed with power applied to the unit. However, check the INSTALLATION and MAINTENANCE sections of the manual as well as the module schematic diagram to insure there are no objections to this practice.

4. When servicing a circuit module, avoid carpeted areas, dry environments, and certain types of clothing (silk, nylon, etc.) because they contribute to static buildup.

5. All electrically powered test equipment should be grounded. *Apply* the *ground lead* from the test equipment to the circuit module *before* connecting the *test probe*. Similarly, *disconnect* the *test probe prior* to removing the *ground lead*.

6. If a circuit module is removed from the system, it is desirable to lay it on a conductive surface (such as a sheet of aluminum foil) which is connected to ground through 100k of resistance.

WARNING
If the aluminum foil is connected directly to ground, be cautious of possible electrical shock from contacting the foil at the same time as other electrical circuits.

7. When soldering, be sure the soldering iron is grounded.

8. Prior to connecting jumpers, replacing circuit components, or touching CMOS pins (if this becomes necessary in the replacement of an integrated circuit device), be sure to discharge any static buildup as described in procedure 1. Since voltage differences can exist across the human body, it is recommended that only one hand be used if it is necessary to touch pins on the CMOS device and associated board wiring.

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68P81106E84-C
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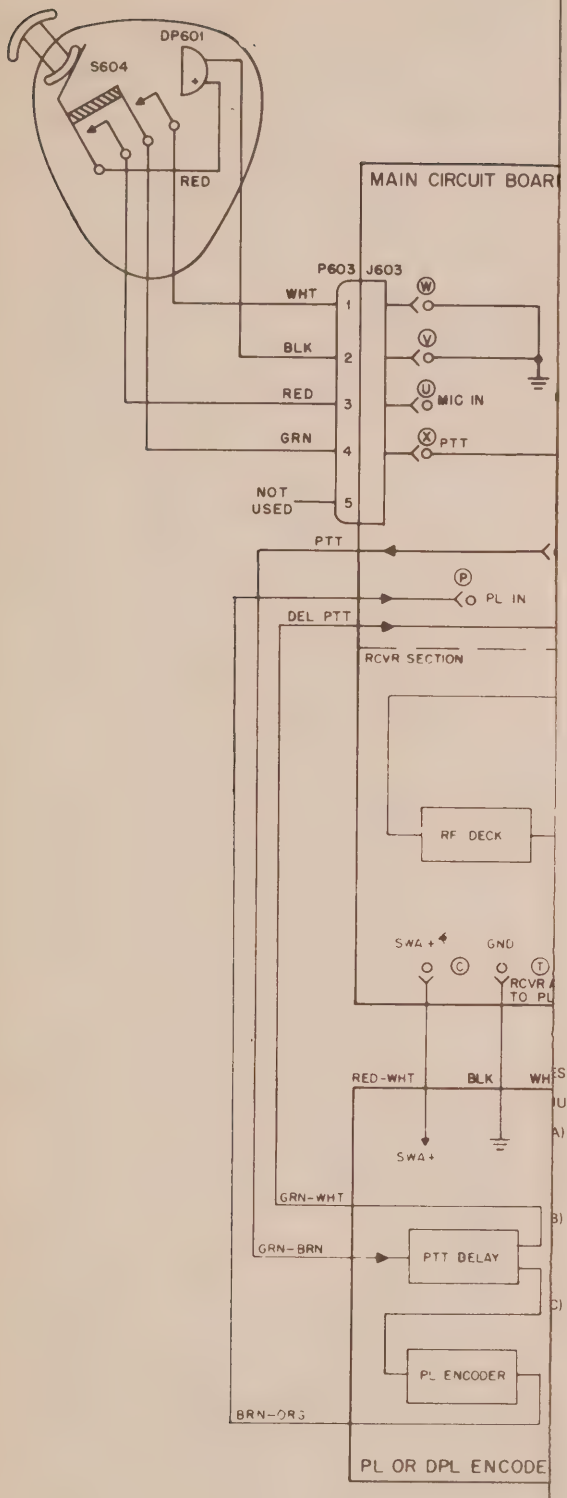
9. When replacing a CMOS integrated circuit device, leave the device in its metal rail container or conductive foam until it is to be inserted into the printed circuit module.

10. All low impedance test equipment (such as pulse generators, etc.) should be connected to CMOS device inputs after power is applied to the CMOS circuitry. Similarly, such low impedance equipment should be disconnected before power is turned off.

11. Replacement modules shipped separately from the factory will be packaged in a conductive material. Any modules being transported from one area to another should be wrapped in a simlar material (aluminum foil may be used). NEVER USE NON-CONDUCTIVE MATERIAL for packaging these modules.

AL INTERCONNECT DIAGRAM



ES:

U2 AND JU102 ADDED FOR CARRIER SQUELCH RADIOS.

A) P601–2 RETURNED TO GROUND VIA BLK–RED LEAD TO "PRIVATE–LINE" OR "DIGITAL PRIVATE–LINE" ENCODER BOARD ON "PRIVATE–LINE" AND "DIGITAL PRIVATE–LINE" MODELS.

B) IF HANG–UP BOX IS USED WITH CARRIER SQUELCH RADIO (TO RESET OPTIONAL DECODER), GROUND RETURN WIRE (P/O TRN6290A GROUND WIRE KIT) MUST BE ADDED FROM P601–2 TO CHASSIS.

C) IF "QUIK–CALL" DECODER WITH HORN AND LIGHT OPTION IS USED, GROUND RETURN FOR HANG–UP BOX IS MADE VIA TRN6810A GROUND EXTENDER KIT AND P601–2 IS USED FOR ANOTHER FUNCTION.

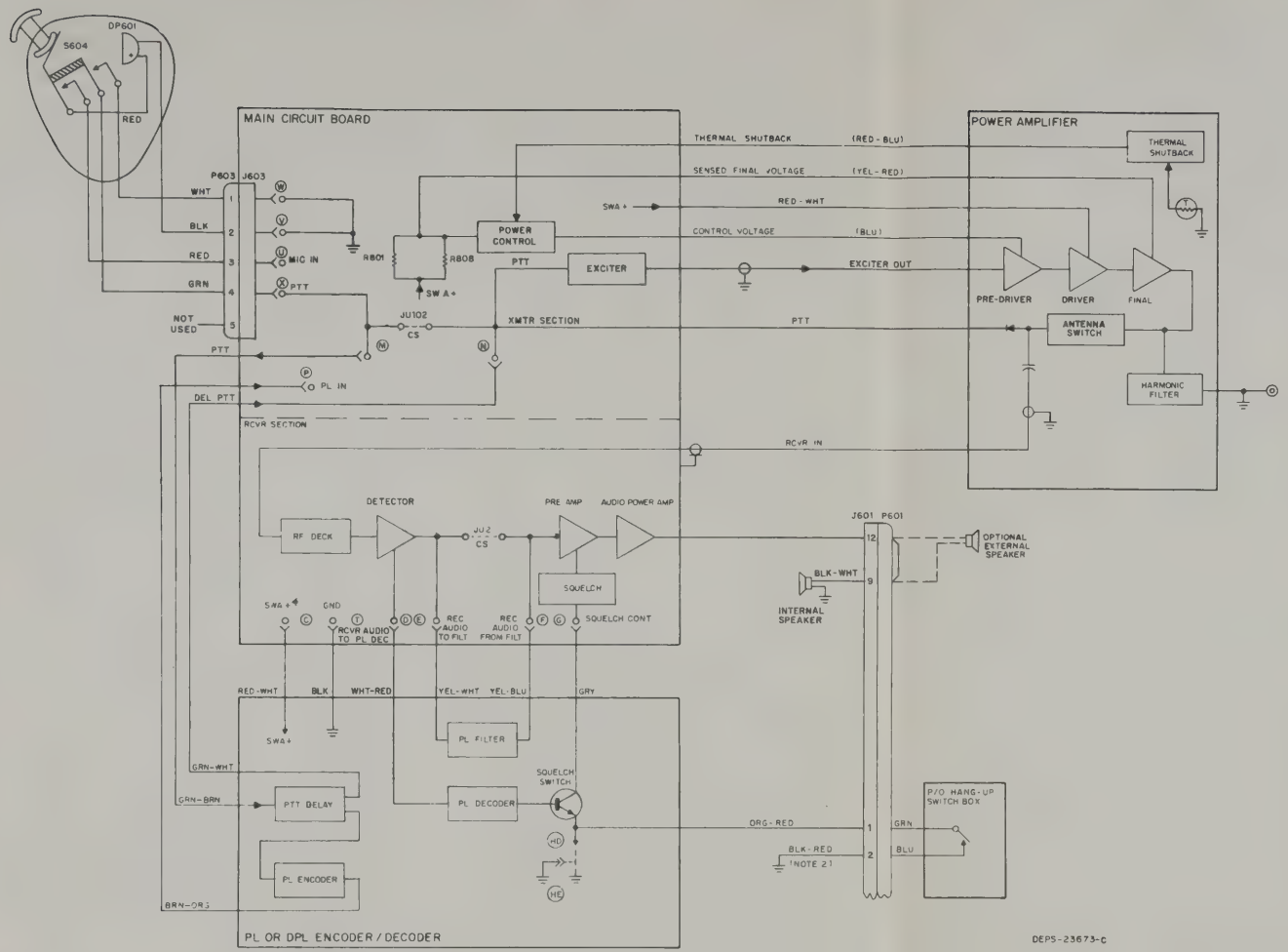
Maxar-80 UHF Radio, 30 W/25 W
Functional Interconnect Diagram
Motorola No. DEPS-23673-C
5/25/81-PHI

9. When replacing a CMOS integrated circuit device, leave the device in its metal rail container or conductive foam until it is to be inserted into the printed circuit module.

10. All low impedance test equipment (such as pulse generators, etc.) should be connected to CMOS device inputs after power is applied to the CMOS circuitry. Similarly, such low impedance equipment should be disconnected before power is turned off.

11. Replacement modules shipped separately from the factory will be packaged in a conductive material. Any modules being transported from one area to another should be wrapped in a simlar material (aluminum foil may be used). NEVER USE NON-CONDUCTIVE MATERIAL for packaging these modules.

FUNCTIONAL INTERCONNECT DIAGRAM



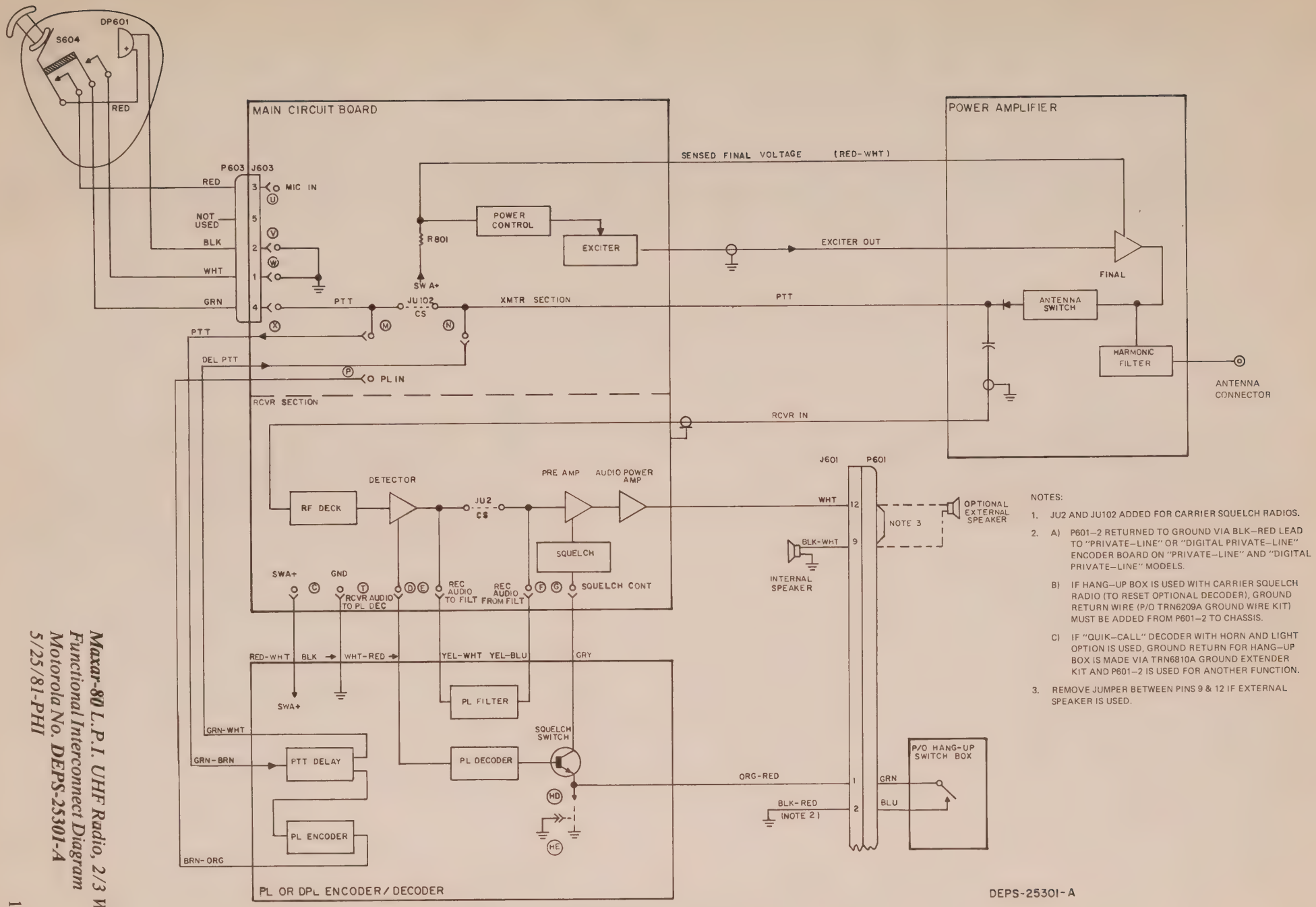
NOTES

1. JU2 AND JU102 ADDED FOR CARRIER SQUELCH RADIOS
2. A) P601-2 RETURNED TO GROUND VIA BLK-RED LEAD TO "PRIVATE-LINE" OR "DIGITAL PRIVATE-LINE" ENCODER BOARD ON "PRIVATE-LINE" AND "DIGITAL PRIVATE-LINE" MODELS

   B) IF HANG-UP BOX IS USED WITH CARRIER SQUELCH RADIO (TO RESET OPTIONAL DECODER), GROUND RETURN WIRE (P/O TRN6290A GROUND WIRE KIT) MUST BE ADDED FROM P601-2 TO CHASSIS

   C) IF "QUIK-CALL" DECODER WITH HORN AND LIGHT OPTION IS USED, GROUND RETURN FOR HANG-UP BOX IS MADE VIA TRN6810A GROUND EXTENDER KIT AND P601-2 IS USED FOR ANOTHER FUNCTION

Maxar-80 UHF Radio, 30 W/25 W
Functional Interconnect Diagram
Motorola No. DEPS-23673-C
5/25/81-PHI



NOTES:

1. JU2 AND JU102 ADDED FOR CARRIER SQUELCH RADIOS.
2. A) P601–2 RETURNED TO GROUND VIA BLK–RED LEAD TO "PRIVATE–LINE" OR "DIGITAL PRIVATE–LINE" ENCODER BOARD ON "PRIVATE–LINE" AND "DIGITAL PRIVATE–LINE" MODELS.

   B) IF HANG–UP BOX IS USED WITH CARRIER SQUELCH RADIO (TO RESET OPTIONAL DECODER), GROUND RETURN WIRE (P/O TRN6209A GROUND WIRE KIT) MUST BE ADDED FROM P601–2 TO CHASSIS.

   C) IF "QUIK–CALL" DECODER WITH HORN AND LIGHT OPTION IS USED, GROUND RETURN FOR HANG–UP BOX IS MADE VIA TRN6810A GROUND EXTENDER KIT AND P601–2 IS USED FOR ANOTHER FUNCTION.
3. REMOVE JUMPER BETWEEN PINS 9 & 12 IF EXTERNAL SPEAKER IS USED.

2/3 W FUNCTIONAL INTERCONNECT DIAGRAM

Maxar-80 L.P.I. UHF Radio, 2/3 W
Functional Interconnect Diagram
Motorola No. DEPS-25301-A
5/25/81-PHI

TEST EQUIPMENT

METERING ADAPTER CABLES AND ADAPTER CABLE

uired Test Equipment

	R	plication
	Motorol	nts, general
readings re- gh input neter	Motorol	
ge nts	Motorol	
measure-	Motorol	
observation	Telequip	
output urement	Motorol appropri T1013 R	
frequency nt	Motorol S1343 Se	
modulation easurement	Motorol S1343 Se	
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d e Squelch oting	Motorol	
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d transmitter	Motorol	
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	RC
	RC
	XM
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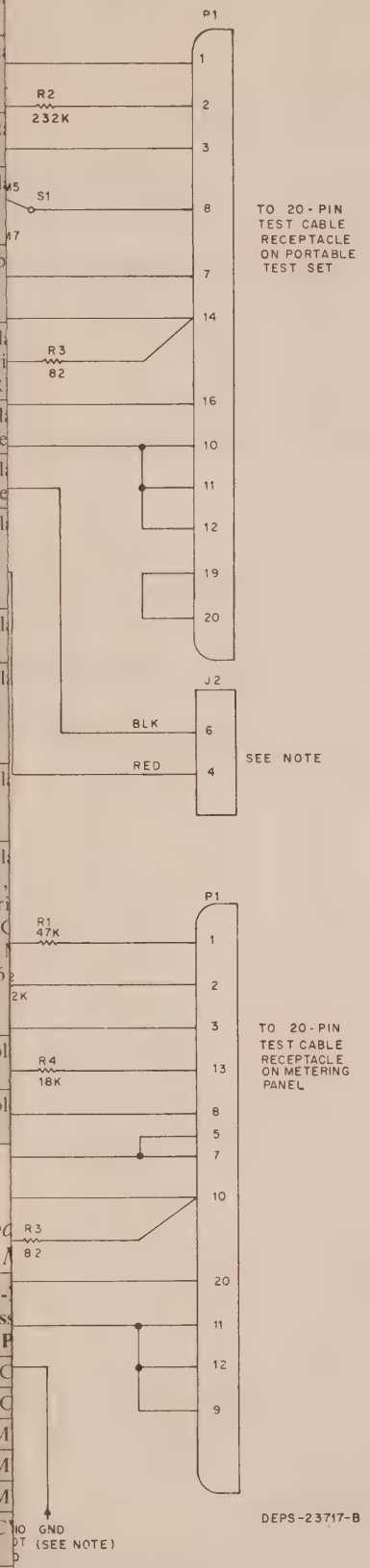


TEST EQUIPMENT, METERING ADAPTER CABLES, AND ADAPTER CABLE

Motorola No. PEPS-26037-B
6/15/83- PHI

parts list

SKN6030A Metering Adapter Cable — PL-6814-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82783B10	1 uF ± 20%, 50 V (not supplied as part of this kit, must be ordered separately)
		fuse, cartridge:
F1	65-86099	7.5 amp, 32 V
		connector, receptacle:
J2		connector, includes:
	15-80315A39	housing, receptacle, 15-pin with ears
	29-84706E04	terminal, female; 2 used
		connector, plug:
P101		connector, includes:
	15-80315A40	housing, plug, 15-pin with ears
	29-84706E03	terminal, male; 11 used
P1		connector, includes:
	15-84821B10	housing
	15-84819B01	end cover, right hand
	15-80313A03	end cover, left hand
	9-84306A96	connector, female, 10-contacts 1, 2-18
	9-84306A97	connector, female, 10-contacts 3, 4-20
		resistor, fixed:
R1	6-11099C89	47k ± 5%; 1/4 W
R2	6-10621E24	232k ± 1%; 1/8 W
R3	6-11099C23	82 ± 5%; 1/4 W
		switch:
S1	40-82148F01	SPDT
		non-referenced parts
	1-82779C01	FUSEHOLDER ASSEMBLY, includes
	14-86882A01	BODY
	14-82883A01	CAP
	41-82885A01	SPRING
	42-82884A01	CLIP; 2 used
	2-9627	NUT, 4-40 x 3/16"; 2 used
	3-114831	SCREW, machine, 4-40 x 7/16"; 2 used
	4-7683	LOCKWASHER, internal, #4; 2 used
	42-80313A05	STRAIN RELIEF; 2 used
	42-83345E01	CABLE CLAMP
	42-84066A60	TIE WRAP; 2 used

RPX4028A Adapter Cable — PL-5385-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
J101		**connector, receptacle:** includes:
	15-83292K01	HOUSING, 15 pin
	29-84706E04	TERMINAL, female; 9 req'd.
P601		**connector, plug:** includes:
	15-83958L01	HOUSING, 17 pin
	29-84706E03	TERMINAL, male; 9 req'd.
	29-82335A03	TERMINAL, male; 2 req'd.
		fuse, cartridge:
F601	65-4637	20 amp
		non-referenced items
	2-9627	NUT, #4; 2 req'd.
	3-114831	SCREW, 4-40 x 3/16; 2 req'd.
	4-7693	LOCKWASHER, #4, 2 req'd.
	29-82607B03	LUG, ring; 2 req'd.
	15-83957L01	HOUSING, 17 pin
	29-82336A03	TERMINAL, female; 2 req'd.
	30-82020H01	CABLE, 12 conductor
	42-10217A02	CABLE, tie
	42-80313A05	STRAIN RELIEF

SKN6029A Metering Adapter Cable — PL-6813-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82783B10	1 uF, ± 20%; 50 V (not supplied as part of this kit, must be ordered separately)
		fuse, cartridge:
F1	65-86099	7.5 amp, 32 V
		connector, receptacle:
P101		connector, includes:
	15-80315A39	housing, receptacle; 15-pin with ears
	29-84706E03	terminal, male; 11 used
		connector, plug:
P1	9-855266	female, 20-contact
		resistor, fixed:
R1	6-11099C89	47k ± 5%; 1/4 W
R2	6-10621E24	232k ± 1%; 1/8 W
R3	6-11099C23	82 ± 5%; 1/4 W
R4	6-11099C79	18k ± 5%; 1/4 W
		non-referenced parts
	1-82779C01	FUSEHOLDER ASSEMBLY, includes:
	14-86882A01	BODY
	14-82883A01	CAP
	41-82885A01	SPRING
	42-82884A01	CLIP; 2 used
	2-9627	NUT, 4-40 x 3/16"; 2 used
	3-114831	SCREW, machine, 4-40 x 7/16"; 2 used
	3-138943	SCREW, tapping, 4-24 x 1/4"; 2 used
	4-7683	LOCKWASHER, internal, #4; 2 used
	29-82607B03	LUG; 2 used
	42-80313A05	STRAIN RELIEF; 2 used
	42-84066A60	TIE WRAP; 2 used

Required Test Equipment For MAXAR-80 Radio Servicing

General Type	Application	Recommended Model	Min. Specifications
AC-DC VOM	DC voltage measurements, general	Motorola T1009	Measurement range: 0-15 V dc Sensitivity: 20,000 ohms/volt
DC Multimeter	DC voltage readings requiring a high input resistance meter	Motorola S1063	Measurement range: 0-15 V dc Input resistance: 11 megohms
AC Voltmeter	Audio voltage measurements	Motorola S1053	Measurement range: 0-10 V ac Input resistance: 10 megohms
RF Voltmeter	RF voltage measurements	Motorola S1339	Measurement range: 100 uV-3 V from 1 MHz-512 MHz Inputs: 50 ohms and high impedance
Oscilloscope	Waveform observation	Telequipment Model D61	Vertical sensitivity: 10 mV-10 V/division Horizontal time base: 1 usec. -1 sec/division
RF Wattmeter	Transmitter output power measurement	Motorola wattmeter with appropriate element and T1013 RF Dummy Load	Measurement range: 0-50 Watts
Frequency Meter	Transmitter frequency measurement	Motorola R1200A Series, S1343 Series, or S1344 Series	Measurement range: 450-512 MHz Frequency resolution: 10 Hz
Deviation Meter	Transmitter modulation deviation measurement	Motorola R1200 Series, S1343 Series or S1344 Series	Measurement range: 0-10 kHz deviation Frequency range: 450-512 MHz
RF Signal Generator	Receiver alignment and troubleshooting	Motorola S1329A	Frequency range: 450-512 MHz Output level: 0.1 uV-100,000 uV Must be capable of at least ± 3 kHz deviation when modulated by 1 kHz tone
Audio Signal Generator	Audio Circuit troubleshooting	Motorola S1067	Frequency range: 20 Hz-20 kHz Output level: 50 mV-1 V
PL Tone Generator*	Tone-Coded *Private-Line* Squelch Decoder troubleshooting	Motorola SLN6221	Frequency range: 50 Hz-200 Hz Output level: 0-500 mV
DPL Test Set**	*Digital Private-Line* Squelch Encoder-Decoder troubleshooting	Motorola SLN6413	
Radio Test Set w/appropriate metering cable (SKN6029A for TEK-5 and SKN6030A for Portable Test Set)	Meter reading at circuit metering points for alignment and troubleshooting	Motorola S1056-59 Portable Test Set, TEK5B or C Metering Panel with TEK40 Conversion Kit, or TEK5E Metering Panel. See Figure 6	See Figure 6
10.7 MHz Signal Source	Adjustment of receive frequency	Motorola R1200 Series	1 mV output
Tuning Tool Kit	Receiver and transmitter alignment	Motorola TRN6210A	

* Required for tone-coded *Private-Line* Squelch Models only
** Required for *Digital Private-Line* Squelch Models only

Switch Positions For Models S1056-59 Portable Test Set With SKN6030A Metering Adapter Cable

Metering Point	Test Set Meter Selector Switch Position	RCVR-XMTR Accessories Switch Position	Meter OFF-REV Switch Position	Remarks
1	1	RCV	REV	
2	2	RCV	REV	
3	3	XMTR	REV	
5	7	XMTR	OFF	S1 IN POSITION M5 (A)
7	7	XMTR	OFF	S1 IN POSITION M7 (B)
RCVR AUDIO	11	RCVR	OFF	2 V AC OR 0.2 V AC METER RANGE

NOTE: RADIO MUST BE KEYED WITH "XMTR ON" BUTTON ON TEST SET WHEN TEST CABLE IS CONNECTED.

Switch Positions For TEK-5 Metering Panel With SKN6029A Adapter Cable

1. SET TEK-5 SELECTOR SWITCH TO POSITION C.
2. SET TEK-5 XMIT-REC SWITCH TO REC POSITION FOR M1, M2, AND RCVR AUDIO. SET XMIT-REC SWITCH TO XMIT FOR M3, M5 AND M7.
3. DURING "IDC" ADJUSTMENT RADIO MUST BE KEYED WITH "KEY" BUTTON IF AUDIO IS APPLIED AT CABLE MIC AUDIO INPUT.

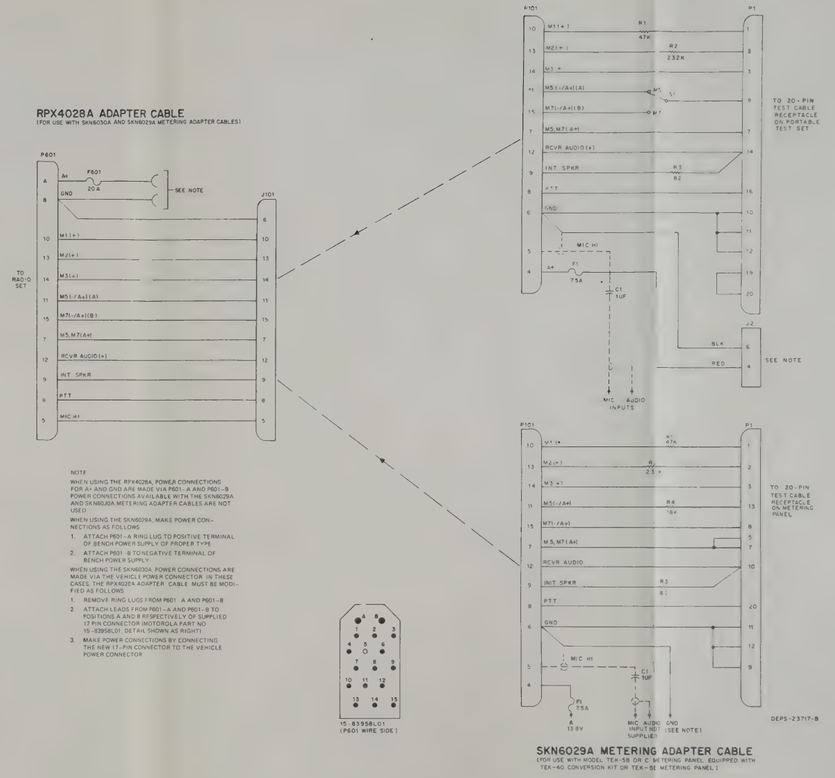

RPX4028A ADAPTER CABLE
(FOR USE WITH SKN6030A AND SKN6029A METERING ADAPTER CABLES)
P601
J101
TO RADIO SET
SEE NOTE
NOTE
WHEN USING THE RPX4028A, POWER CONNECTIONS FOR A+ AND GND ARE MADE VIA P601-A AND P601-B. POWER CONNECTIONS AVAILABLE WITH THE SKN6029A AND SKN6030A METERING ADAPTER CABLES ARE NOT USED.
WHEN USING THE SKN6029A, MAKE POWER CONNECTIONS AS FOLLOWS
1. ATTACH P601-A RING LUG TO POSITIVE TERMINAL OF BENCH POWER SUPPLY OF PROPER TYPE
2. ATTACH P601-B TO NEGATIVE TERMINAL OF BENCH POWER SUPPLY
WHEN USING THE SKN6030A, POWER CONNECTIONS ARE MADE VIA THE VEHICLE POWER CONNECTOR. IN THESE CASES, THE RPX4028A ADAPTER CABLE MUST BE MODIFIED AS FOLLOWS
1. REMOVE RING LUGS FROM P601-A AND P601-B
2. ATTACH LEADS FROM P601-A AND P601-B TO POSITIONS A AND B RESPECTIVELY OF SUPPLIED 17 PIN CONNECTOR (MOTOROLA PART NO 15-83958L01, DETAIL SHOWN AS RIGHT)
3. MAKE POWER CONNECTIONS BY CONNECTING THE NEW 17-PIN CONNECTOR TO THE VEHICLE POWER CONNECTOR
15-83958L01 (P601 WIRE SIDE)
SKN6030A METERING ADAPTER CABLE
(FOR USE WITH MODEL S1056-59 PORTABLE TEST SET)
P101
P1
TO 20-PIN TEST CABLE RECEPTACLE ON PORTABLE TEST SET
MIC HI
MIC AUDIO INPUTS
SEE NOTE
SKN6029A METERING ADAPTER CABLE
(FOR USE WITH MODEL TEK-5B OR C METERING PANEL EQUIPPED WITH TEK-40 CONVERSION KIT OR TEK-5E METERING PANEL)
TO 20-PIN TEST CABLE RECEPTACLE ON METERING PANEL
MIC AUDIO GND (INPUT NOT SUPPLIED)
DEPS-23717-B

Figure 6. Metering Adapter Cables

TEST EQUIPMENT

METERING ADAPTER CABLES AND ADAPTER CABLE

TEST EQUIPMENT, METERING ADAPTER CABLES, AND ADAPTER CABLE

TRANSMITTER ALIGNMENT 30 W/25 W
ONE AND TWO-FREQUENCY MODELS

n 33/28 watts, go back
nment a second time. I
proceed as follows:

l) so that power output

nitter schematic diagra

615 FAEPS–26311–O (X456)

ustment Locations

IDC ADJUSTMENT

NOTE

ncy adjustment must be made BEFORE setting the IDC controls.

ng controls as needed.

uelch radios, remove the *Vibrasponder* resonant reed from its socket on the PL

radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating

) from main circuit board.

signal generator to J601 as follows:

apacitor (+ end toward the radio) to J601-5.
o chassis.

NOTE

t be keyed by pressing the KEY button on the test set or by shorting
r the radio chassis. DO NOT USE THE MICROPHONE PTT
HE TRANSMITTER DURING IDC ADJUSTMENT.

the audio signal generator output.

IDC Adjustment Procedure

Procedure
frequency to 1000 Hz and output level to 0.8 V.
just F1 "IDC" control R126 for ± 5 kHz deviation meter reading.
key transmitter. Adjust F2 "IDC" control R136 for ± 5 kHz deviation
tput level until deviation meter reads ± 3.0 kHz. Audio oscillator 3 dB.
Tone Coded Private-Line Squelch Models Only
n PL board and disconnect audio oscillator from J601.
Level control R433 for PL tone deviation reading of ± 800 Hz.
to J601-5 and -6 and repeat Steps 1 through 3. Be sure overall z, including PL tone.
or
Digital Private-Line Squelch Models Only (see note)
ator from J601.
de Level set control R342 for a DPL code deviation reading
ator to J601-5 and -6. Repeat Steps 1 through 3. Be sure overall z, including DPL code.

NOTE

easurement of transmitter deviation in radios equipped with *Digital* coded squelch, the frequency response of the deviation measuring ess than 1 Hz. If a deviation meter with this low frequency response available, the transmitter deviation can be checked by making the inuous Turn-Off code during the measurement. Since the Turn-Off usoidal, standard test equipment will then provide an accurate devia- To make the transmitter send continuous Turn-Off code, short emitter plating of PTT Inverter Q309 and key the transmitter.

TRANSMITTER ALIGNMENT 30 W/25 W

ONE AND TWO-FREQUENCY MODELS

PREALIGNMENT NOTES

1. In some cases, peak readings may occur at two points in the tuning range of a coil. Always choose point where slug is nearest top of coil form (away from circuit board).

2. Unnecessary tuning adjustments should be avoided. Usually, only a "touch-up" transmitter alignment is needed. Complete transmitter alignment is needed in the following cases:

   a. After changing transmitter operating frequency.
   b. After replacing a component in a frequency-sensitive network.

3. Before beginning a complete alignment, preset tuning adjustments as follows:

   a. Set L120 seven turns from top of form.
   b. Set C613 one turn counterclockwise from full right.
   c. Set C615 fully counterclockwise (full out).
   d. Set L110 (and L111 in 2-frequency models) seven turns from circuit board.

NOTE

Low or no meter 3 reading will be obtained if L110 and L111 are not properly preset.

   e. Starting with slugs of L225, 226, and 227 flush with tension nut, set slugs six turns above nut.
   f. Set L112, L113, L114, L115, and L118 according to Figure 1.

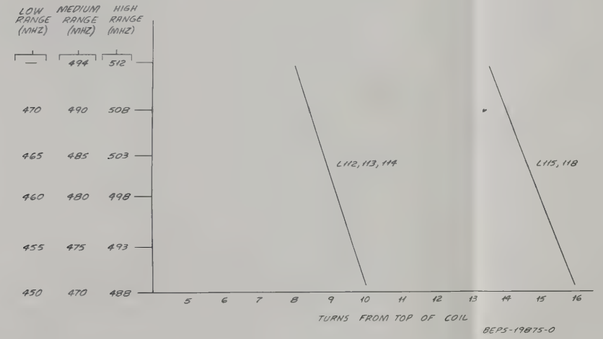


Figure 1. Coil Preset Chart

g. Set power set control R804 fully counterclockwise (as viewed from solder side of board).

CAUTION

While tuning the transmitter, M7 must not exceed 17.5 uA. Adjust power set control R804 clockwise (as viewed from solder side of board) as necessary to maintain M7 below 17.5 uA.

4. Key transmitter for each step in alignment procedure and de-key after alignment step is completed.

CAUTION

Avoid keying an unaligned transmitter for prolonged periods.

5. Transmitter frequency calculations:

   $f_c = 27\ f_{osc.}$, where f_c = carrier frequency, and f_{osc} = crystal oscillator frequency.

6. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable. The metering adapter cables and directions for their use are shown in the Test Equipment section. Metering may be accomplished with a 20,000 ohm-per- volt voltmeter if a test set or metering panel is not available. Refer to the metering tables on this page.

7. Connect an rf wattmeter, terminated in a resonant antenna or 50-ohm resistive dummy load, to radio set antenna connector J602.

8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.6 volts.

TRANSMITTER METERING

Table 1. Transmitter Meter Readings, Using TEK-5 Metering Panel or S1056-59 Portable Test Set

Meter	Measurement	Reading,(uA)	Remarks
3	Buffer Amplifier Input	8 (min.)	
5	Exciter Amplifier Collector Current	25 (typ.) 40 (max.)	
7	PA Current	13.5 (typ.) 17.5 (max.)	Multiply M7 x 0.336 to obtain PA Final Current in Amps

Table 2. Transmitter Meter Readings With 20,000 Ohm/Volt Voltmeter

Metering Function	Voltmeter Lead Connections		Voltmeter Scale	Typical Reading
	+	—		
M3 Buffer Ampl. Input	J601-14	Chassis Ground	50 uA, DC	8 uA min.
M5 Exciter Output Amplifier Collector Current	J601-7	J601-11	100 mA, DC	17 mA Typ. 100 mA max.
M7 PA Current	J601-7	J601-15	500 mA, DC	230 mA Typ. 300 mA Max.

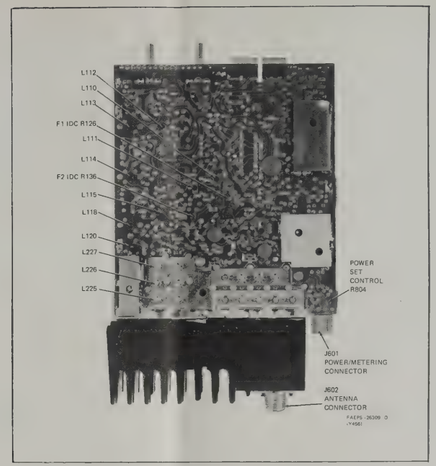


Figure 2. Transmitter Adjustment Locations

TRANSMITTER ALIGNMENT

NOTE

Radios should be tuned on lower frequency except where indicated.

Step	Adjust	Metering Point	Desired Reading
1. Oscillator Output	L112 then L113	M3	Peak
2. Buffer Output	L114	M3	Dip if no M5 reading
		M5	Peak if M5 has a reading
3. First Tripler Output	L115 then L118	M5	Peak
4. Second Tripler Output	L120	Wattmeter	Peak if wattmeter has reading
		M5	Peak if no wattmeter reading
NOTE Loosen the heat sink securing screw and swing open the PA chassis for access to adjustments in the steps below.			
5. Predriver Output	C607	Wattmeter	Peak. If no wattmeter reading, go to Step 6
6. Second Tripler Output Filter	L225,226,227	Wattmeter	Peak. If no wattmeter reading, turn C607 1/4 T clockwise and repeat Step 6
7. Predriver and Final Output	C607,613,615	Wattmeter	Peak
8. Repeat all adjustments made to this point.			
9. Predriver Output	C607	Wattmeter	Adjust for 20 watt output
10. Second Tripler Output	L225,226,227	Wattmeter	Peak each coil while keeping wattmeter reading between 20 and 25 watts with C607
11. Oscillator Output	L112	Wattmeter	Adjust for 15 watts output
	L113	Wattmeter	Adjust for 15 watts output not obtainable by tuning L112 alone
12. Second Tripler Output	L120	Wattmeter	Peak. If wattmeter reading is greater than 20 watts, repeat Steps 11 and 12
13. Repeat Step 10			
14. Oscillator	L112, then L113	M3	Peak
15. Predriver Output	C607	Wattmeter	Peak
For widespaced operation (greater than 2 MHz separation), go to Step 16A; otherwise go to Step 17.			
NOTE STEPS 16A THROUGH F ARE FOR WIDE-SPACED FREQUENCY OPERATION ONLY.			
16A.	L112	M3	Peak on higher frequency
16B.	L115	M5	Peak on higher frequency
16C.	L114	M5	Peak on lower frequency
16D.	C607	Wattmeter	Adjust for 20 watt output power on higher frequency
16E.	L225	Wattmeter	Peak on higher frequency
16F.	C607	Wattmeter	Peak
17. Power Output	R804	Wattmeter	Tune power set control R804, for maximum power output. Adjust R804 clockwise (as viewed from solder side of board) to reduce power output to 33 watts (28 watts for 470-512 MHz band). For widespaced operation, adjust R804 clockwise (as viewed from solder side of main board) so that the channel with the lowest power output is *32 watts (27 watts for 470-512 MHz band).
18. Final Output	C613, 615	Wattmeter	Retune for maximum power output. For widespaced operation, retune on lower frequency
19. Repeat Steps 17 and 18 as needed.			
20. Thermal Shutback Level Set (see note)	R609	Wattmeter	Disconnect the jumper from pin A on the P.A. board and adjust R609 for 16 watts on the channel with the lowest output power. Reconnect the jumper to pin A.
21. Close power amplifier housing and tighten heatsink to chassis			
22. Power Output	R804	Wattmeter	Repeat Step 17. Keep M7 below 17.5 uA

NOTE: Proper setting of thermal shutback level is essential for reliable operation of the transmitter during long transmissions.

NOTE

If the maximum power output obtainable is less than 33/28 watts, go back to Step 2 of the transmitter alignment procedure and repeat the alignment a second time. If the maximum obtainable power output is still below 33/28 watts, proceed as follows:

IF MAXIMUM IS BETWEEN 31/26 AND 33/28 WATTS:

Adjust R804 clockwise (as viewed from solder side of board) so that power output just begins to drop (less than 1/2 watt).

IF MAXIMUM IS LESS THAN 30/25 WATTS:

The transmitter may be malfunctioning. Refer to the transmitter schematic diagram for troubleshooting information.

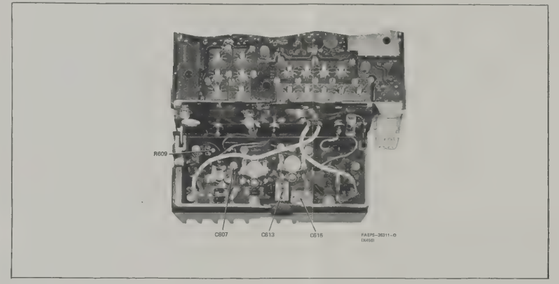


Figure 3. 30/25 Watt PA Adjustment Locations

OSCILLATOR FREQUENCY ADJUSTMENT

Oscillator should be set on frequency AFTER transmitter has been aligned and BEFORE modulation deviation is set.

NOTE

The transmit frequency of this radio should only be adjusted when the ambient temperature is 82 °F (28 °C). Because of temperature and voltage variations between factory and field locations, the frequency measured may not correspond to the assigned frequency. If the measured frequency is between the limits shown in Figure 4 make no attempt to correct the frequency.

If the measured frequency does not fall within the limits shown in Figure 4, it is recommended that the radio be returned to a room temperature environment (approximately 82°F, 28°C) and the frequency reset using the procedure following Figure 4.

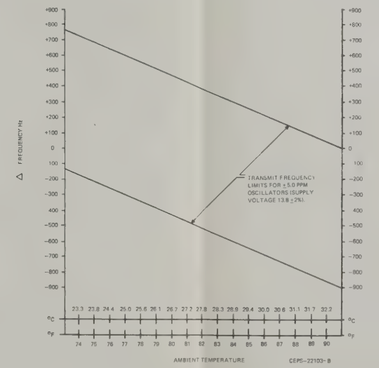


Figure 4. Acceptable Limits For Field Frequency Measurements

1. Set up the frequency meter or counter controls as required.
2. In tone-coded *Private-Line* squelch (PL) radios, remove the *Vibrasponder* resonant reed from its socket on the PL board.
   In *Digital Private-Line* squelch (DPL) radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating side of board).

Frequency Adjustment Procedure

Step	Procedure
1	Select F1
2	Key transmitter with no modulation
3	Adjust L110 for F1 frequency ± 100 Hz
	Two-Frequency Models Only
4	Select F2
5	Adjust L111 for F2 frequency ± 100 Hz

TRANSMITTER ALIGNMENT 30 W/25 W

ONE AND TWO-FREQUENCY MODELS

IDC ADJUSTMENT

NOTE

Oscillator frequency adjustment must be made BEFORE setting the IDC controls.

1. Set the deviation meter operating controls as needed.
2. In tone coded *Private-Line* squelch radios, remove the *Vibrasponder* resonant reed from its socket on the PL board.
   In *Digital Private-Line* squelch radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating side of board.)
3. Disconnect mic input lead (red) from main circuit board.
4. Connect the output of an audio signal generator to J601 as follows:

   High side through a 1 uF capacitor (+ end toward the radio) to J601-5.
   Low side to J601-6 or radio chassis.

NOTE

The transmitter must be keyed by pressing the KEY button on the test set or by shorting J601-8 to J601-6 or the radio chassis. DO NOT USE THE MICROPHONE PTT SWITCH TO KEY THE TRANSMITTER DURING IDC ADJUSTMENT.

5. Connect an ac voltmeter across the audio signal generator output.

IDC Adjustment Procedure

Step	Procedure
1	Set audio signal generator output frequency to 1000 Hz and output level to 0.8 V.
2	Select F1 and key transmitter. Adjust F1 "IDC" control R126 for ± 5 kHz deviation meter reading.
3	On 2-freq. models, select F2 and key transmitter. Adjust F2 "IDC" control R136 for ± 5 kHz deviation meter reading.
4	Reduce audio signal generator output level until deviation meter reads ± 3.0 kHz. Audio oscillator output level should be 160 mV ± 3 dB.
	Tone Coded Private-Line Squelch Models Only
5	Insert resonant reed into socket on PL board and disconnect audio oscillator from J601.
6	Key transmitter and adjust Tone Level control R433 for PL tone deviation reading of ± 800 Hz.
7	Reconnect audio signal generator to J601-5 and -6 and repeat Steps 1 through 3. Be sure overall deviation does not exceed ± 5 kHz, including PL tone.
	or
	Digital Private-Line Squelch Models Only (see note)
5	Disconnect the audio signal generator from J601.
6	Key the transmitter and adjust Code Level set control R342 for a DPL code deviation reading of 900 Hz.
7	Reconnect the audio signal generator to J601-5 and -6. Repeat Steps 1 through 3. Be sure overall deviation does not exceed ± 5 kHz, including DPL code.

NOTE

To obtain accurate measurement of transmitter deviation in radios equipped with *Digital Private-Line* binary-coded squelch, the frequency response of the deviation measuring equipment must be less than 1 Hz. If a deviation meter with this low frequency response characteristic is not available, the transmitter deviation can be checked by making the transmitter send continuous Turn-Off code during the measurement. Since the Turn-Off code waveform is sinusoidal, standard test equipment will then provide an accurate deviation measurement. To make the transmitter send continuous Turn-Off code, short together the base and emitter plating of PTT Inverter Q309 and key the transmitter.

RECEIVER ALIGNMENT 30 W/25 W AND 2 W/3 W L.P.I.

ONE AND TWO-FREQUENCY MODELS

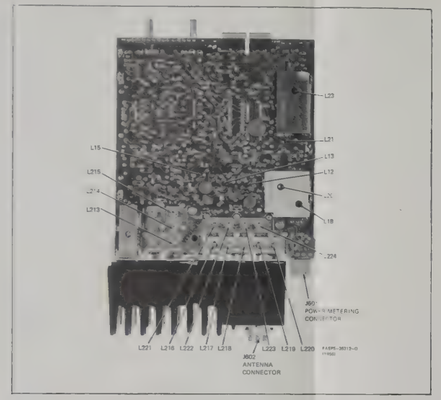


Figure 1. Receiver Adjustment Location Detail

RECEIVER METERING

Table 1. Typical Receiver Meter Readings With TEK-5 Metering Panel or S1056-59 Portable Test Set

Meter	Measurement	Reading, uA
1	IF Amplifier Signal Level	8-14 (No Signal) 50 (40 uV Input)
2	Quadrature Detector Output	22 ± 1
3	Injection Oscillator Output	15-25 uA

Table 2. Receiver Meter Readings With 20,000 Ohm/Volt Voltmeter

Metering Point	Voltmeter Lead Connections +	Voltmeter Lead Connections —	Voltmeter Scale	Typical Readings
M1 IF Ampl. Signal Level	J601-10	Chassis Ground	2.5 V DC	.25-.5 V (No Signal) 1.75 V (40 uV Input)
M2 Quadrature Dector Output	J601-13	Chassis Ground	10 V DC (5.5 V if measured with DC multimeter)	5.1 V ± .2 V
M3 Injection Osc. Output	J601-14	Chassis Ground	50 uA DC	15-25 uA

68P81039E16-B
5/25/81-PHI

PREALIGNMENT NOTES

1. On *Digital Private-Line* squelch and *Private-Line* squelch radio sets, disable the DPL or PL decoder by depressing the front panel MONITOR pushbutton, or removing microphone from hangup box.
2. In some cases, peak meter readings may occur at two points in the tuning range of a coil. Always choose point where the slug is nearest the top of the coil form (away from the circuit board).
3. Unnecessary tuning adjustments should be avoided. Usually, the receiver will require only a "touch-up" alignment. Complete receiver alignment is necessary in the following cases:

   a. After changing the receiver operating frequency.
   b. After replacing a component in a frequency-sensitive network.

4. Before beginning a complete receiver alignment, preset tuning adjustments as follows:

   a. Set L221, 222, 223, 224 nine turns CCW from fully in position.
   b. Set L213, 214, 215, 216, 217, 218, 219, 220 seven turns CCW from fully in position.
   c. Set L12, 13, 15, 18, 20, 21, 23 flush with main circuit board.

5. Receiver frequency calculations:

   $$f_{osc} = \frac{f_c - 10.7\ MHz}{9} \text{ and } f_{inj} = 9\, f_{osc} = f_c - 10.7\ MHz;$$

   Where f_c = carrier frequency, f_{osc} = oscillator crystal frequency, and f_{inj} = mixer injection freq.

6. Two-frequency radios should be tuned on highest operating frequency.
7. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable. The metering adapter cables and directions for their use are shown in the Test Equipment section. Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to the metering tables on this page. Readings taken with VOM will not be accurate if meter panel or test set is connected simultaneously.
8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

RECEIVER ALIGNMENT

NOTE
Transmitter alignment must be performed before receiver alignment.

	Step	Input Signal	Signal Input Point	Adjust	Monitoring Point	Desired Reading
1	Quadrature Detector	10.7 MHz @ 1 mV	Near Q12; allow signal to "spray" into circuit (Note 1)	L23	Meter 2	22 ± 1 uA
						or
					DC Multimeter at J601-13	5.5 V DC
2	Injection Oscillator			Freq Select Switch in "F1", adjust L13	Meter 3	Peak
				Freq Select Switch in "F2", adjust L12	Meter 3	Peak
				Freq Select Switch to lowest freq position, then:		
				L15	Meter 3	Max
				L221		Peak
				L222		Dip
				L223		Peak
				L224		Dip
3	Preselector	Adjust un-modulated signal generator to receive freq. (max. on M1; ± 18 kHz of formula frequency)	Antenna Connector	Set Freq. Select Switch to highest freq. position, then adjust L220, 219, 218, 217		Peak. (Adjust signal generator input level to keep M1 in the 25 uA-35 uA range)
4	Preamp Input	Receive freq. @ 10 mV (Note 2)	Antenna Connector	L213, 214, 215	Meter 1	Peak. (Adjust signal generator input level to keep M1 in the 25 uA-35 uA range)
5	Fine Freq. Adj.	Receive freq. (counted)	Antenna Connector	L13 for freq. #1 L12 for freq. #2 (2 freq only)	Radio Speaker	Audio zero beat.
		10.7 MHz Osc	"Spray" into base of Q12 (Note 1)			
6	IF Tuning	Receive Freq (counted)	Antenna Connector	L18, 20, 21	Meter 1	Peak M1 with L18, 20, 21, then detune L21 1/2 turn ccw.
7	Injection Touch-up	Receive Freq. (no modulation). Adjust level for 30 uA reading on M1.	Antenna Connector	L15	Meter 1	Detune for 20 uA reading on M1
				L224, 223, 222, 221; then repeat L15	Meter 1	Peak
					Meter 3	Peak
8	Final Touch-Up	Set to highest receive frequency		Detune ccw 1/2 turn L216, 217, 218, 219, 220		
		Receive freq (no modulation)		L220, 219, 218, 217, 216 and 215 in descending order		Maximum quieting (Adjust signal level to maintain approx. 20 dBq)

NOTES:
1. With a wire connected to a 10.7 MHz signal source output, "spray" the signal near Q12 (that is, place the wire close to Q12) but do not allow the wire to make physical contact with any part of the i-f amplifier.
2. To Set signal generator on frequency, either use a counter on the generator output or use the zero beat method (Step 5). Do not use meter 2 to set frequency.

20 DB QUIETING SENSITIVITY MEASUREMENT

1. Connect an ac voltmeter across the speaker.
2. On PL model radio sets, disable PL by depressing the MONITOR button on the radio set front panel, or by removing microphone from hangup box.
3. Turn the SQUELCH control fully counterclockwise.
4. Turn on the radio set and adjust the VOLUME control until a reading of 2 volts is obtained on the ac voltmeter.
5. Connect an rf signal generator to the radio set antenna connector. Set the signal generator to the carrier frequency, and set the generator output level control to minimum.
6. Slowly increase the output level of the rf signal generator until the ac voltmeter reads 0.2 volts.
7. Note the signal generator output signal level. This signal level is the 20 dB quieting sensitivity of the receiver.

TRANSMITTER METERING

Table 1. Transmitter Meter Readings, Using TEK-5 Metering Panel or S1056-59 Portable Test Set

Meter	Measurement	Reading,(uA)	Remarks
3	Buffer Amplifier Input	8 (min.)	
5	Exciter Amplifier Collector Current	25 (typ.) 40 (max.)	
7	PA Current	13.5 (typ.) 17.5 (max.)	Multiply M7 x 0.336 to obtain PA Final Current in Amps

Table 2. Transmitter Meter Readings With 20,000 Ohm/Volt Voltmeter

Metering Function	Voltmeter Lead Connections +	Voltmeter Lead Connections —	Voltmeter Scale	Typical Reading
M3 Buffer Ampl. Input	J601-14	Chassis Ground	50 uA, DC	8 uA min.
M5 Exciter Output Amplifier Collector Current	J601-7	J601-11	100 mA, DC	17 mA Typ. 100 mA Max.
M7 PA Current	J601-7	J601-15	500 mA, DC	230 mA Typ 300 mA Max.

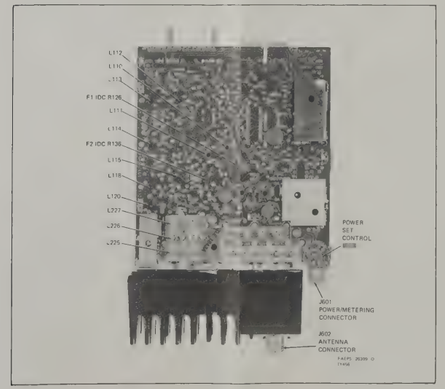


Figure 1. Transmitter Adjustment Locations

PREALIGNMENT NOTES

1. In some cases, peak readings may occur at two points in the tuning range of a coil. Always choose point where slug is nearest top of coil form (away from circuit board).

2. Unnecessary tuning adjustments should be avoided. Usually, only a "touch-up" transmitter alignment is needed. Complete transmitter alignment is needed in the following cases:

   a. After changing transmitter operating frequency.
   b. After replacing a component in a frequency-sensitive network.

3. Before beginning a complete alignment, preset tuning adjustments as follows:

   a. Set L120 seven turns into coil from top of form.
   b. Set C613 one turn counterclockwise from full tight.
   c. Set C615 fully counterclockwise tight (full out).
   d. Set L110, L111, L905, and L906 seven turns from circuit board.

   CAUTION

   Low or no meter 3 reading will be obtained if L110, L111, L905, and L906 are not properly preset.

   e. Starting with slugs of L225, 226, and 227 flush with tension nut, set slugs six turns above nut.

   f. Set L112, L113, L114, L115, and L118 according to the prealignment tuning chart shown in Figure 1.

   g. Set power set control R804 fully counterclockwise (as viewed from solder side of board).

   CAUTION

   While tuning the transmitter, M7 must not exceed 17.5 uA. Adjust power set control R804 clockwise (as viewed from solder side of board) as necessary to maintain M7 below 17.5 uA.

4. Key transmitter for each step in alignment procedure and de-key after alignment step is completed.

   CAUTION

   Avoid keying an unaligned transmitter for prolonged periods.

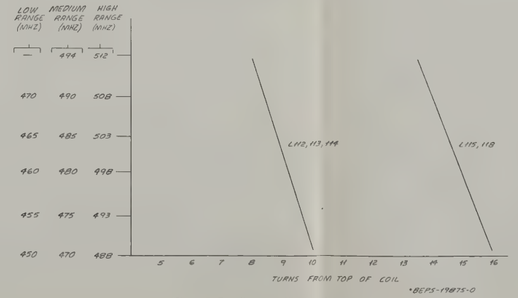


Figure 2. Prealignment Tuning Chart

5. Transmitter frequency calculations:

   $f_c = 27\ f_{osc.}$, where f_c = carrier frequency, and f_{osc} = crystal oscillator frequency.

6. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable (refer to Test Equipment section). Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to the metering tables on this page.

7. Connect an rf wattmeter, terminated in a resonant antenna or 50-ohm resistive dummy load, to radio set antenna connector J602.

8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

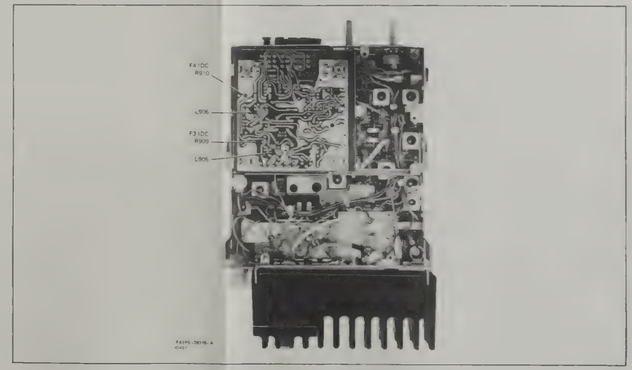


Figure 3. Four-Frequency Board Adjustment Location Detail (Transmitter)

TRANSMITTER ALIGNMENT 30 W/25 W

FOUR-FREQUENCY MODELS

TRANSMITTER ALIGNMENT

NOTE

Two-frequency radios should be tuned on lower frequency except where indicated.

	Step	Adjust	Metering Point	Desired Reading
1.	Oscillator Output	L112 then L113	M3	Peak
2.	Buffer Output	L114	M3	Dip if no M5 reading
			M5	Peak if M5 has a reading
3.	First Tripler Output	L115 then L118	M5	Peak
4.	Second Tripler Output	L120	Wattmeter	Peak if wattmeter has reading
			M5	Peak if no wattmeter reading
5.	Predriver Output	C607	Wattmeter	Peak. If no wattmeter reading, go to Step 6
6.	Second Tripler Output Filter	L225,226,227	Wattmeter	Tune L225, L226, and L227 sequentially 1 turn each until power out is observed. If no power out is observed, turn C607 1/4 turn clockwise, and preset L225, L226, and L227 6 turns above nut and repeat step 6. Once a reading is obtained, peak wattmeter reading with L225, L226, and L227.
7.	Predriver and Final Output	C607,613,615	Wattmeter	Peak
8.	Repeat all adjustments made to this point.			
9.	Predriver Output	C607	Wattmeter	Adjust for 20 watt output
10.	Second Tripler Output	L225,226,227	Wattmeter	Peak each coil while keeping wattmeter reading between 20 and 25 watts with C607
11.	Oscillator Output	L112	Wattmeter	Adjust for 15 watts output
		L113	Wattmeter	Adjust for 15 watts output if not obtainable by tuning L112 alone
12.	Second Tripler Output	L120	Wattmeter	Peak. If wattmeter reading is greater than 20 watts, repeat Steps 11 and 12
13.	Repeat Step 10	"		
14.	Oscillator	L112, then L113	M3	Peak
15.	Predriver Output	C607	Wattmeter	Peak

For widespaced operation (greater than 2 MHz separation), go to Step 16A; otherwise go to Step 17.

NOTE

STEPS 16A THROUGH F ARE FOR WIDE-SPACED FREQUENCY OPERATION ONLY.

16A.		L112	M3	Peak on higher frequency
16B.		L115	M5	Peak on higher frequency
16C.		L114	M5	Peak on lower frequency
16D.		C607	Wattmeter	Adjust for 20 watt output power on higher frequency
16E.		L225	Wattmeter	Peak on higher frequency
16F.		C607	Wattmeter	Peak
17.	Power Output	R804	Wattmeter	Tune power set control R804, for maximum power output. Adjust R804 clockwise (as viewed from solder side of board) to reduce power output to 33 watts (28 watts for 470-512 MHz band). For widespaced operation, adjust R804 clockwise (as viewed from solder side of main board) so that the channel with the lowest power output is 32 watts (27 watts for 470-512 MHz band).
18.	Final Output	C613, 615	Wattmeter	Retune for maximum power output. For widespaced operation, retune on lower frequency
19.	Repeat Steps 17 and 18 as needed.			
20.	Power Output	L226	Wattmeter	Adjust power supply voltage to 10.9 Volts. Switch between highest and lowest frequency and balance power out with L226. Adjust power supply to 13.6 Volts.
21.	Thermal Shutback Level Set (see note)	R609	Wattmeter	Disconnect the jumper from pin A on the P.A. board and adjust R609 for 16 watts on the channel with the lowest output power. Reconnect the jumper to pin A.
22.	Close power amplifier housing and tighten heatsink to chassis.			
23.	Power Output	R804	Wattmeter	Repeat Step 17. Keep M7 below 17.5 uA

NOTE

Proper setting of thermal shutback level is essential for reliable operation of the transmitter during long transmissions.

NOTE

If the maximum power output obtainable is less than 33/28 watts, go back to Step 2 of the transmitter alignment procedure and repeat the alignment a second time. If the maximum obtainable power output is still below 33/28 watts, proceed as follows:

IF MAXIMUM IS BETWEEN 31/26 AND 33/28 WATTS:

Adjust R804 clockwise (as viewed from solder side of board) so that power output just begins to drop (less than 1/2 watt).

IF MAXIMUM IS LESS THAN 30/25 WATTS:

The transmitter may be malfunctioning. Refer to the transmitter schematic diagram for troubleshooting information.

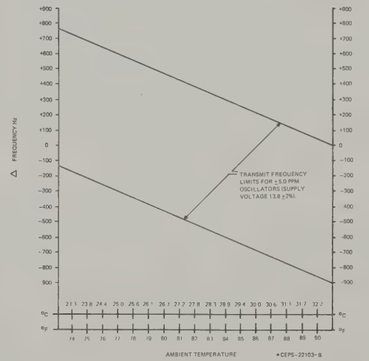


Figure 4. Acceptable Limits for Field Frequency Measurements

OSCILLATOR FREQUENCY ADJUSTMENT

Oscillators should be set on frequency AFTER transmitter has been aligned and BEFORE modulation deviation is set. On radios with transmitter frequency stability of 2 ppm, refer to instruction section 68P81035E04 before performing the following procedures (1 and 2 freq. models only).

NOTE

The transmit frequency of this radio should only be adjusted when the ambient temperature is 82° F (28° C). Because of temperature and voltage variations between factory and field locations, the frequency measured may not correspond to the assigned frequency. If the measured frequency is between the limits shown in Figure 4, make no attempt to correct the frequency.

If the measured frequency does not fall within the limits shown in Figure 4, it is recommended that the radio be returned to a room temperature environment (approximately 82° F, 28° C) and the frequency reset using the procedure described below.

1. Set up the frequency meter or counter controls as required.
2. In tone-coded *Private-Line* squelch (PL) radios, remove the *Vibrasponder* resonant reed from its socket on the PL board.
   In *Digital Private-Line* squelch (DPL) radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating side of board).

Frequency Adjustment Procedure

Step	Procedure
1	Select F1
2	Key transmitter with no modulation
3	Adjust L110 for F1 frequency ± 100 Hz
	Two-Frequency Models Only
4	Select F2
5	Adjust L111 for F2 frequency ± 100 Hz
	Four-Frequency Models Only
6	Select F3
7	Adjust L905 for F3 frequency ± 100 Hz
8	Select F4
9	Adjust L906 for F4 frequency ± 100 Hz

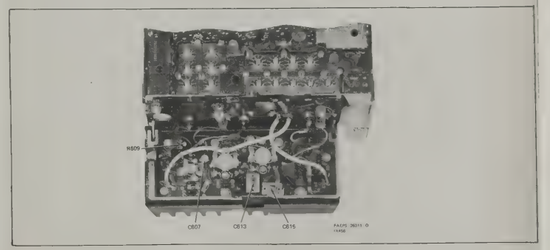


Figure 3. 30/25 Watt PA Adjustment Locations

IDC ADJUSTMENT

NOTE

Oscillator frequency adjustment must be made BEFORE setting the IDC controls

1. Set the deviation meter operating controls as needed.
2. In tone coded *Private-Line* squelch radios, remove the *Vibrasponder* resonant reed from its socket on the PL board.
   In *Digital Private-Line* squelch radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating side of board.)
3. Disconnect mic input lead (red) from main circuit board.
4. Connect the output of an audio signal generator to J601 as follows:

   High side through a 1 uF capacitor (+ end toward the radio) to J601-5.
   Low side to J601-6 or radio chassis.

NOTE

The transmitter must be keyed by pressing the KEY button on the test set or by shorting J601-8 to J601-6 or the radio chassis. DO NOT USE THE MICROPHONE PTT SWITCH TO KEY THE TRANSMITTER DURING IDC ADJUSTMENT.

5. Connect an ac voltmeter across the audio signal generator output.
6. Perform the IDC Adjustment given below.

IDC Adjustment Procedure

Step	Procedure
1	Set audio signal generator output frequency to 1000 Hz and output level to 0.8 V.
2A	Select F1 and key transmitter. Adjust F1 "IDC" control R126 for ± 4.75 kHz deviation meter reading.
2B	Select F2 and key transmitter. Adjust F2 "IDC" control R136 for ± 4.75 kHz deviation meter reading.
2C	Select F3 and key transmitter. Adjust F3 "IDC" control R909 for ± 4.75 kHz deviation meter reading.
2D	Select F4 and key transmitter. Adjust F4 "IDC" control R10 for ± 4.75 kHz deviation meter reading.
3	Reduce audio signal generator output level until deviation meter reads ± 3.0 kHz. Audio oscillator output level should be 160 mV ± 3 dB.
	Tone Coded Private-Line Squelch Models Only
4	Insert resonant reed into socket on PL board and disconnect audio oscillator from J601.
5	Key transmitter and adjust Tone Level control R433 for PL tone deviation reading of ± 800 Hz.
6	Reconnect audio signal generator to J601-5 and -6 and repeat Steps 1 and 2. Be sure overall deviation does not exceed ± 4.75 kHz, including PL tone.
	or
	Digital Private-Line Squelch Models Only (see note below)
4	Disconnect the audio signal generator from J601.
5	Key the transmitter and adjust Code Level set control R342 for a DPL code deviation reading of 900 Hz.
6	Reconnect the audio signal generator to J601-5 and -6. Repeat Steps 1 and 2. Be sure overall deviation does not exceed ± 4.75 kHz, including DPL code.

NOTE

To obtain accurate measurement of transmitter deviation in radios equipped with *Digital Private-Line* binary-coded squelch, the frequency response of the deviation measuring equipment must be less than 1 Hz. If a deviation meter with this low frequency response characteristic is not available, the transmitter deviation can be checked by making the transmitter send continuous Turn-Off code during the measurement. Since the Turn-Off code waveform is sinusoidal, standard test equipment will then provide an accurate deviation measurement. To make the transmitter send continuous Turn-Off code, short together the base and emitter plating of PTT Inverter Q309 and key the transmitter.

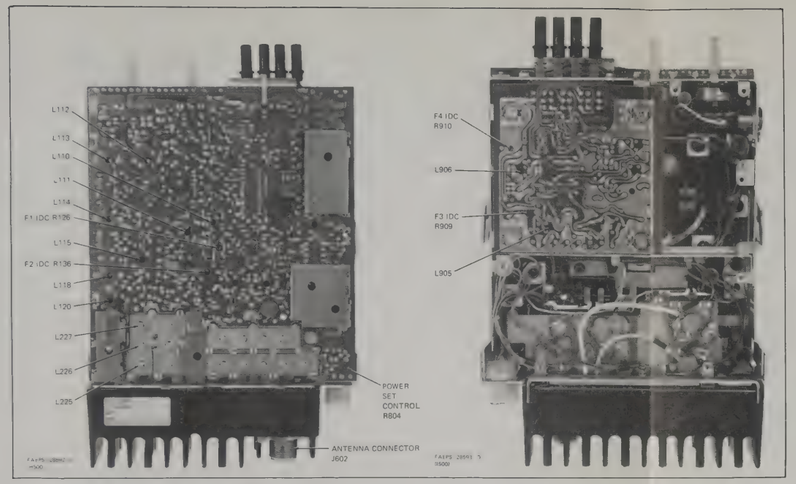


Figure 1. Transmitter Adjustment Locations

TRANSMITTER METER READING

Table 1. Transmitter Meter Readings, Using TEK-5 Metering Panel or S1056-59 Portable Test Set

Meter	Measurement	Reading (uA)	Remarks
3	Buffer Amplifier Input	8 (MIN)	
5	Exciter Amplifier Collector Current	25 (TYP.) 40 (MAX)	
7	PA Current	13.5 (TYP.) 20.5 (MAX)	Multiply M7 x 0.039 to obtain PA Final Current in Amps

Table 2. Transmitter Meter Readings With 20,000 Ohm/Volt Voltmeter

Metering Function	Voltmeter Lead Connections +	Voltmeter Lead Connections —	Voltmeter Scale	Typical Reading
M3 Buffer Ampl. Input	J601-14	Chassis Ground	50 uA, DC	8 uA min.
M5 Exciter Output Amplifier Collector Current	J601-7	J601-11	100 mA, DC	17 mA. Typ. 100 mA. Max.
M7 PA Current	J601-7	J601-15	2.5 V DC	0.25 V Typ. 0.45 V Max.

PREALIGNMENT NOTES

1. In some cases, peak readings may occur at two points in the tuning range of a coil. Always choose point where slug is nearest top of coil form (away from circuit board).

2. Unnecessary tuning adjustments should be avoided. Usually, only a "touch-up" transmitter alignment is needed. Complete transmitter alignment is needed in the following cases:

   a. After changing transmitter operating frequency.
   b. After replacing a component in a frequency-sensitive network.

3. Before beginning a complete alignment, preset tuning adjustments as follows:

   a. Set L120 seven turns from top of form.
   b. Set C613 one turn counterclockwise from tight.
   c. Set C615 fully countercloswise from tight (full out).
   d. Set L110 (and L111 in 2-frequency models, L905 and 906 in 4-freq. models) 7 turns from circuit board.

CAUTION

Low or no meter 3 reading will be obtained if L110, L111, L905, L906 are not properly preset.

   e. Starting with slugs of L225, 226, and 227 flush with tension nut, set slugs six turns above nut.

   f. Set L112, L113, L114, L115, and L118 according to the Prealignment Tuning Chart shown in Figure 2.

   g. Set power set control R804 fully counterclockwise (viewed from solder side of board) for maximum transmitter power output.

4. Key transmitter for each step in alignment procedure and de-key after alignment step is completed.

CAUTION

Avoid keying an unaligned transmitter for prolonged periods.

5. Transmitter frequency calculations:

   $f_c = 27\ f_{osc.}$, where f_c = carrier frequency, and f_{osc} = crystal oscillator frequency.

6. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable (refer to Test Equipment section). Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to the metering tables on this page.

7. Connect an rf wattmeter, terminated in a resonant antenna or 50-ohm resistive dummy load, to radio set antenna connector J602.

8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

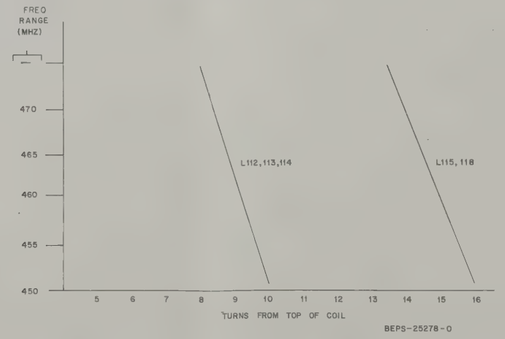


Figure 2. Prealignment Tuning Chart

TRANSMITTER ALIGNMENT 2 W/3 W

ONE, TWO, AND FOUR FREQUENCY MODELS

TRANSMITTER ALIGNMENT

NOTE

Radios should be tuned on lower frequency except where indicated.

Step	Adjust	Metering Point	Desired Reading
1. Oscillator Output	L112 then L113		Peak M3
2. Buffer Output	L114	M3	Dip if no M5 reading
		M5	Peak if M5 has a reading
3. First Tripler Output	L115 then L118	M5	Peak
4. Exciter Output	L120	Wattmeter	Peak if wattmeter has reading
		M5	Peak if no wattmeter reading
NOTE Loosen the heatsink securing screw and swing open the PA chassis for access to adjustments in the steps below.			
5. Second Tripler output Filter	L225, 226, 227	Wattmeter	Peak. If no wattmeter readings, adjust L225, L226, L227 sequentially one turn at a time until reading is obtained. Once reading is obtained, peak wattmeter with L225, L226, and L227.
6. Predrive and Final Output	C612, C614	Wattmeter	Peak
7. Repeat all adjustments made to this point.			
8. Buffer	L114	Wattmeter	Adjust for 1.5 watts output.
9. Second Tripler Output	L225, 226, 227	Wattmeter	Peak tune.
10. Second Tripler Output	L120	Wattmeter	Peak
11. Buffer Output	L114	M5	Peak
12. Oscillator	L112 then L113	M3	Peak
For widespaced operation (greater than 0.5 MHz separation), go to Step 13A; otherwise go to Step 14.			
NOTE STEPS 13A THROUGH E ARE FOR WIDE-SPACED FREQUENCY OPERATING ONLY.			
13A	L115	M5	Peak on higher frequency
13B	L114	M5	Peak on higher frquency
13C	L226	Wattmeter	Detune ccw for .5 W power out on lower frequency.
13D	L227, L226	Wattmeter	Tune L227 then L226 for peak power out on lower frequency.
13E	L226	Wattmeter	Peak on higher frequency and balance power out between higher and lower frequency.
14. Close power amplifier housing and tighten heatsink to chassis.			
15. Power Output	R804	Wattmeter	Adjust R804 for 2 W on higher freq. (3 W for B329 Option). M7 should be below 20.5 uA (0.8 Amps) on both frequencies.
16.	—	M2	Record meter 2 reading with xmtr keyed. This reading will be used when tuning L23 in last step of receiver alignment.

TRANSMITTER ALIGNMENT 2 W/3 W

ONE, TWO, AND FOUR FREQUENCY MODELS

NOTE

If the maximum power output obtainable is less than 2/3 watts, go back to Step 2 of the transmitter alignment procedure and repeat the alignment a second time. If the maximum obtainable power output is still below 2/3 watts, the transmitter may be malfunctioning. Refer to the transmitter schematic diagram for troubleshooting information.

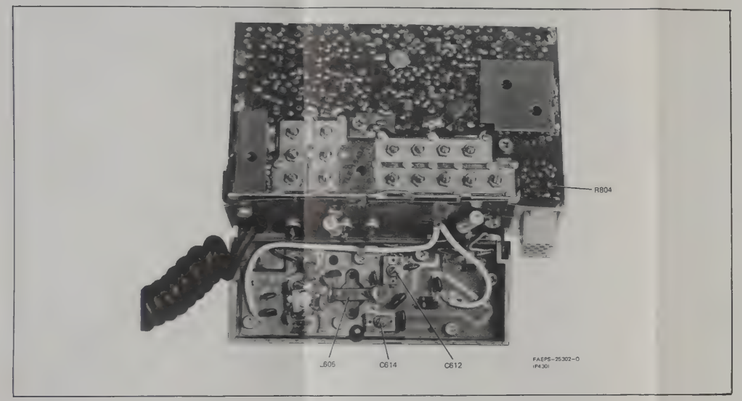


Figure 3. 2/3 Watt PA Adjustment Location Detail

OSCILLATOR FREQUENCY ADJUSTMENT

Oscillators should be set on frequency **AFTER** transmitter has been aligned and BEFORE modulation deviation is set. On radios with transmitter frequency stability of 2 ppm, refer to instruction section 68P81035E04 before performing the following procedures (1 and 2 freq. models only).

NOTE

The transmit frequency of this radio should only be adjusted when the ambient temperature is 82° F (28° C). Because of temperature and voltage variations between factory and field locations, the frequency measured may not correspond to the assigned frequency. If the measured frequency is between the limits shown in Figure 4, make no attempt to correct the frequency.

If the measured frequency does not fall within the limits shown in Figure 4, it is recommended that the radio be returned to a room temperature environment (approximately 82° F, 28° C) and the frequency reset using the procedure described below.

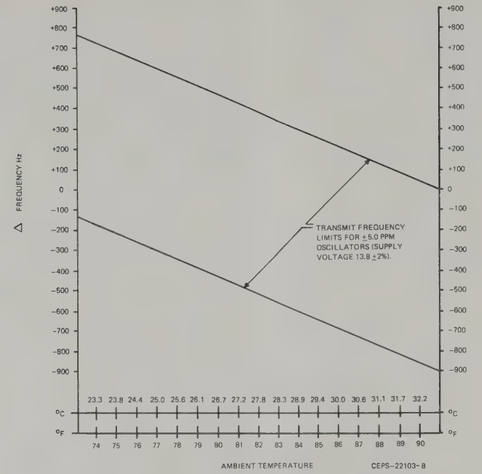


Figure 4. Acceptable Limits for Field Frequency Measurements

1. Set up the frequency meter or counter controls as required.
2. In tone-coded *Private-Line* squelch (PL) radios, remove the *Vibrasponder* resonant reed from its socket on the PL board.
   In *Digital Private-Line* squelch (DPL) radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating side of board).

Frequency Adjustment Procedure

Step	Procedure
1	Select F1
2	Key transmitter with no modulation
3	Adjust L110 for F1 frequency ± 100 Hz
4	Select F2
5	Adjust L111 for F2 frequency ± 100 Hz
6	Select F3
7	Adjust L905 for F3 frequency ± 100 Hz
8	Select F4
9	Adjust L906 for F4 frequency ± 100 Hz

IDC ADJUSTMENT

NOTE

Oscillator frequency adjustment must be made BEFORE setting the IDC controls

1. Set the deviation meter operating controls as needed.
2. In tone coded *Private-Line* squelch radios, remove the *Vibrasponder* resonant reed from its socket on the PL board.
   In *Digital Private-Line* squelch radios, set encoder amplitude to zero by adjusting R342 (fully CCW from plating side of board.)
3. Disconnect mic input lead (red) from main circuit board.
4. Connect the output of an audio signal generator to J601 as follows:

   High side through a 1 uF capacitor (+ end toward the radio) to J601-5.
   Low side to J601-6 or radio chassis.

   NOTE

   The transmitter must be keyed by pressing the KEY button on the test set or by shorting J601-8 to J601-6 or the radio chassis. DO NOT USE THE MICROPHONE PTT SWITCH TO KEY THE TRANSMITTER DURING IDC ADJUSTMENT.

5. Connect an ac voltmeter across the audio signal generator output.
6. Perform the IDC Adjustment given below.

IDC Adjustment Procedure

Step	Procedure
1	Set audio signal generator output frequency to 1000 Hz and output level to 0.8 V.
2A	Select F1 and key transmitter. Adjust F1 "IDC" control R126 for ± 4.75 kHz deviation meter reading.
2B	Select F2 and key transmitter. Adjust F2 "IDC" control R136 for ± 4.75 kHz deviation meter reading.
2C	Select F3 and key transmitter. Adjust F3 "IDC" control R909 for ± 4.75 kHz deviation meter reading.
2D	Select F4 and key transmitter. Adjust F4 "IDC" control R910 for ± 4.75 kHz deviation meter reading.
3	Reduce audio signal generator output level until deviation meter reads ± 3.0 kHz. Audio oscillator output level should be 160 mV ± 3 dB.
	Tone Coded Private-Line Squelch Models Only
4	Insert resonant reed into socket on PL board and disconnect audio oscillator from J601.
5	Key transmitter and adjust Tone Level control R433 for PL tone deviation reading of ± 800 Hz.
6	Reconnect audio signal generator to J601-5 and -6 and repeat Steps 1 through 3. Be sure overall deviation does not exceed ± 4.75 kHz, including PL tone.
	or
	Digital Private-Line Squelch Models Only (see note below)
4	Disconnect the audio signal generator from J601.
5	Key the transmitter and adjust code level set control R342 for a DPL code deviation reading of 900 Hz.
6	Reconnect the audio signal generator to J601-5 and -6. Repeat Steps 1 and 2. Be sure overall deviation does not exceed ± 4.75 kHz, including DPL code.

NOTE

To obtain accurate measurement of transmitter deviation in radios equipped with *Digital Private-Line* binary- coded squelch, the frequency response of the deviation measuring equipment must be less than 1 Hz. If a deviation meter with this low frequency response characteristic is not available, the transmitter deviation can be checked by making the transmitter send continuous Turn-Off code during the measurement. Since the Turn-Off code waveform is sinusoidal, standard test equipment will then provide an accurate deviation measurement. To make the transmitter send continuous Turn-Off code, short together the base and emitter plating of PTT Inverter Q309 and key the transmitter.

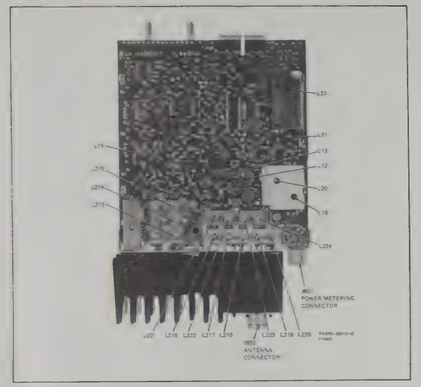


Figure 1. Receiver Adjustment Locations Detail

RECEIVER METERING

Table 1. Typical Receiver Meter Readings With TEK-5 Metering Panel or S1056-59 Portable Test Set

Meter	Measurement	Reading, uA
1	IF Amplifier Signal Level	8-14 (No Signal) 50 (40 uV Input)
2	Quadrature Detector Output	22 ± 1
3	Injection Oscillator Output	15-25 uA

Table 2. Receiver Meter Readings With 20,000 Ohm/Volt Voltmeter

Metering Point	Voltmeter Lead Connections +	—	Voltmeter Scale	Typical Readings
M1 IF Ampl. Signal Level	J601-10	Chassis Ground	2.5 V DC	.25-.5 V (No Signal) 1.75 V (40 uV Input)
M2 Quadrature Detector Output	J601-13	Chassis Ground	10 V DC (5.5 V if measured with DC multimeter)	5.1 V ± .2 V
M3 Injection Osc. Output	J601-14	Chassis Ground	50 uA DC	15-25 uA

PREALIGNMENT NOTES

1. On *Digital Private-Line* squelch and *Private-Line* squelch radio sets, disable the DPL or PL decoder by removing the microphone from the hangup box.
2. In some cases, peak meter readings may occur at two points in the tuning range of a coil. Always choose point where the slug is nearest the top of the coil form (away from the circuit board).
3. Unnecessary tuning adjustments should be avoided. Usually, the receiver will require only a "touch-up" alignment. Complete receiver alignment is necessary in the following cases:
   a. After changing the receiver operating frequency.
   b. After replacing a component in a frequency-sensitive network.
4. Before beginning a complete receiver alignment, preset tuning adjustments as follows:
   a. Set L221, 222, 223, 224 nine turns CCW from fully in position.
   b. Set L213, 214, 215, 216, 217, 218, 219, 220 seven turns CCW from fully in position.
   c. Set L12, 13, 18, 20, 21, 23, 901, 902 flush with the circuit board.
   d. Set L15 and L908 flush with top of coil form.
5. Receiver frequency calculations:

$$f_{osc} = \frac{f_c - 10.7\ MHz}{9}$$

$$f_{inj} = 9\ f_{osc} = f_c - 10.7\ MHz;$$

   Where f_c = carrier frequency, f_{osc} = oscillator crystal frequency, and f_{inj} = mixer injection frequency.
6. Select the highest operating frequency to tune the radio.
7. If a TEK-5 Metering Panel or a S1056-59 Portable Test Set is available, connect the metering panel or test set to J601 using the appropriate metering adapter cable. The metering adapter cables and directions for their use are shown in metering adapter cables diagram in Test Equipment section. Metering may be accomplished with a 20,000 ohm-per-volt voltmeter if a test set or metering panel is not available. Refer to the voltmeter metering table on this page. Readings taken with VOM are not accurate if meter panel or test set is connected simultaneously.
8. Connect a dc power supply to the power leads of the test cable. Set the power supply output to 13.8 volts.

RECEIVER ALIGNMENT PROCEDURE

NOTE
Transmitter alignment must be performed before receiver alignment.

Step	Input Signal	Signal Input Point	Adjust	Monitoring Point	Desired Reading
1 Quadrature Detector	10.7 MHz @ 1 mV	Near Q12, allow signal to "spray" into circuit (Note 1)	L23	Meter 2	22 ± 1 uA or
				DC Multimeter at J601-13	5.5 V DC
2 Injection Oscillator			Freq Select Switch in "F1", adjust L13	Meter 3	Peak
			Freq Select Switch in "F2", adjust L12	Meter 3	Peak
			Freq Select Switch in "F3" and, adjust L901	Meter 3	Peak
			Freq Select Switch in "F4", adjust L902	Meter 3	Peak
			Freq Select Switch to lowest freq position, then:	Meter 3	
			L15		Max
			L908		Max (Note 3)
			Freq Select Switch to lowest freq position, then:		
			L15		Max
			L221		Peak
			L222		Dip
			L223		Peak
			L224		Dip
3 Preselector	Adjust unmodulated signal generator to receive freq. (peak on M1; ± 18 kHz of formula frequency)	Antenna Connector	Set Freq. Select Switch to highest freq. position, then adjust L220, 219, 218, 217		Peak. (Adjust signal generator input level to keep M1 in the 25-35 uA range)
4 Preamp Input	Receive freq. @ 10 mV (Note 2)	Antenna Connector	L213, 214, 215	Meter 1	Peak. (Adjust signal generator input level to keep M1 in the 25-35 uA range)
5 Initial Frequency Adjustment	Receive freq. (counted) *and simultaneously* 10.7 MHz Osc	Antenna Connector "Spray" into base of Q12 (Note 1)	L13 for freq. #1 L12 for freq. #2 L901 for freq. #3 L902 for freq. #4	Radio Speaker	Audio zero beat.
6 IF Tuning	Receive Freq (counted)	Antenna Connector	L18, 20, 21	Meter 1	Peak M1 with L18, 20, 21, then detune L21 one-half turn ccw.
7 Injection Touch-up	Receive Freq. (no modulation). Adjust level for 30 uA reading on M1.	Antenna Connector	L15	Meter 1	Detune for 20 uA reading on M1
			L224, 223, 222, 221; then repeat L15	Meter 1 Meter 3	Peak Peak
8 Final Touch-Up	Set to highest receive frequency		Detune ccw 1/2 turn L216, 217, 218, 219, 220		
	Receive freq (no modulation)		L220, 219, 218, 217, 216 and 215 in descending order		Maximum quieting (Adjust signal level to maintain approx. 20 dBq)
9 Fine Freq. Adj.	Receive Freq. (note 2) *and simultaneously* 10.7 MHz Osc	Antenna Connector "Spray" into base of Q12 (Note 1)	L13 for freq. #1 L902 for freq. #2 L901 for freq. #3 L902 for freq. #4	Radio Speaker	Audio zero beat

NOTES
1. With a wire connected to a 10.7 MHz signal source output, "spray" the signal near Q12 (that is, place the wire close to Q12) but do not allow the wire to make physical contact with any part of the i-f amplifier.
2. To set signal generator on frequency, either use a counter on the generator output or use the zero beat method (Step 5). Do not use Meter 2 to set frequency.
3. If a peak cannot be obtained adjust L908 until Meter 3 just starts dropping. Do not leave slug at top of coil form.
4. If either F3 or F4 is unused initially, frequency adjustments should be made on both channels when additional crystals are added.

20 DB QUIETING SENSITIVITY MEASUREMENT

1. Connect an ac voltmeter across the speaker.
2. On PL model radio sets, disable PL by depressing the MONITOR button on the radio set front panel (if the radio is not equipped with a monitor switch remove the microphone from the hang-up box.).
3. Turn the SQUELCH control fully counterclockwise.
4. Turn on the radio set and adjust the VOLUME control until a reading of 2 volts is obtained on the ac voltmeter.
5. Connect an rf signal generator to the radio set antenna connector. Set the signal generator to the carrier frequency, and set the generator output level control to minimum.
6. Slowly increase the output level of the rf signal generator until the ac voltmeter reads 0.2 volts.
7. Note the signal generator output signal level. This signal level is the 20 dB quieting sensitivity of the receiver, and should be no greater than the level specified in the specifications table in the front of the manual.

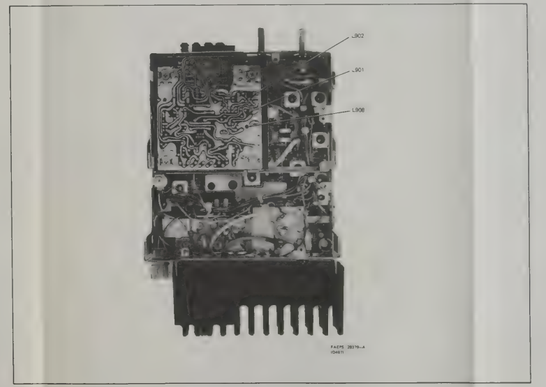


Figure 2. Four-Frequency Board Adjustment Location Detail (Receiver)

RECEIVER ALIGNMENT
30 W/25 W and 2 W/3 W
FOUR FREQUENCY MODELS

68P81042E82-A
5/25/81-PHI

BASE STATION POWER SUPPLY

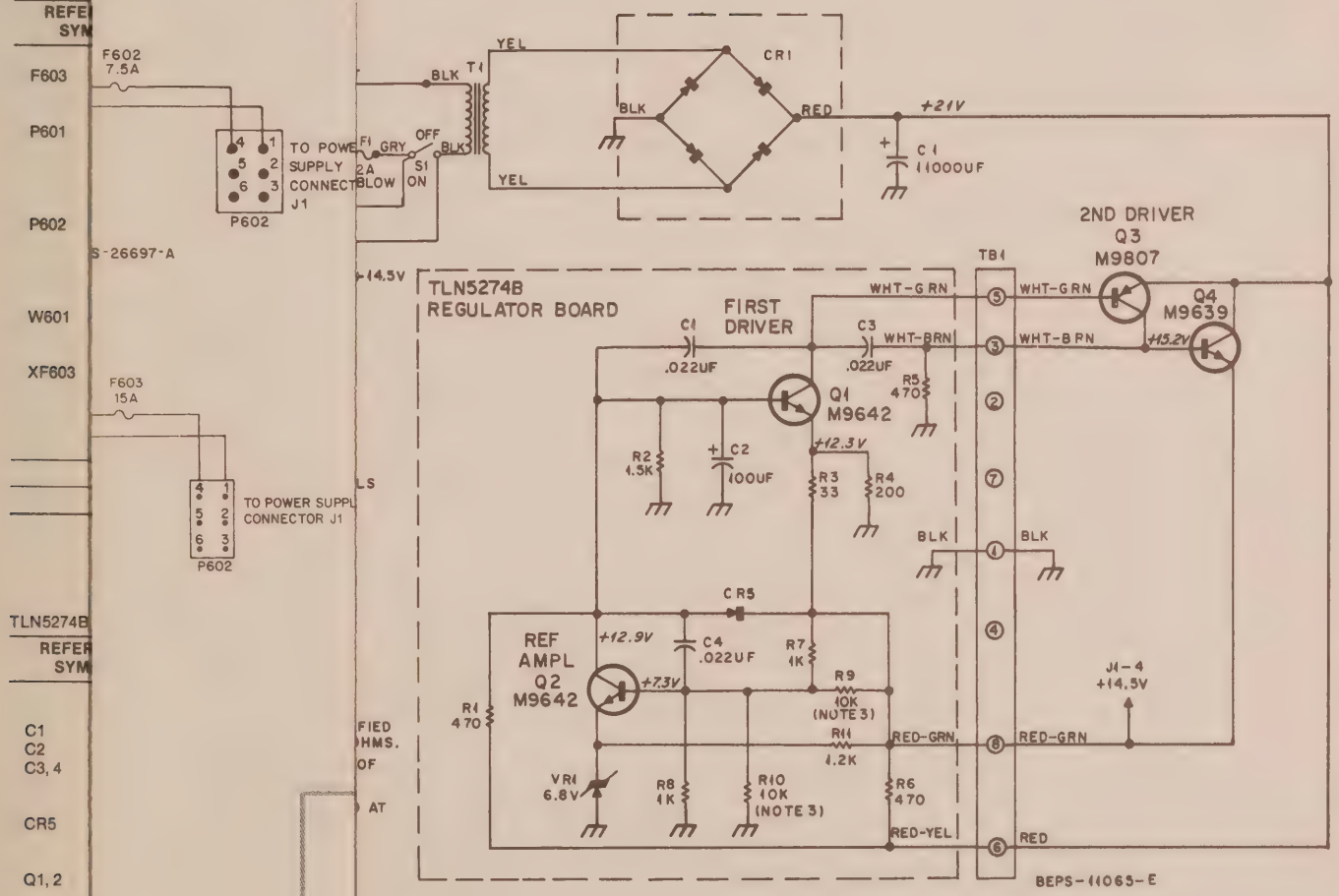
MODEL TPN1136A

POWER CABLES

MODELS TKN6948A, TKN6949A, AND TKN8199A

FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 120 V ac primary power fixed installation.



parts list

TKN6948A Power Cable Kit — PL-6084-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
F602	65-88089	**fuse, cartridge:** 7.5 amp; 32 V; type 3AG; fast-blow
P601		**connector, plug:** Includes:
	15-83293K01	INSULATOR, connector; 15-circuit
	29-84706E05	TERMINAL, pin; male; 4 used
	30-10288A21	WIRE, jumper; BLK
P602		Includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 6 used
W601	30-84396L02	**cable, power:** 2-conductor; (14 ga.); 120" used
XF603		**fuseholder, in-line:** Includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING; compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-13437*	TUBING, heatsink (BLK) 1" length; 2 used

TKN6949A Power Cable Kit — PL-6085-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
F603	65-4165	**fuse, cartridge:** 15 amp; 35 V; fast-blow type
P601		**connector, plug:** Includes:
	15-83958L01	INSULATOR, connector; 17-circuit
	29-82335A01	TERMINAL, pin; male; (large) 2 used
	29-84706E05	TERMINAL, pin; male; (small) 8 used
	30-10288A21	WIRE, jumper; BLK
P602		Includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 6 used
W601	30-84396L02	**cable, power:** 2-conductor; (14 ga.); 120" used
XF603		**fuseholder, in-line:** Includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-13437†	TUBING, heatsink (BLK) 1" length; 2 used

TLN5274B Regulator Board — PL-6361-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C1	8-82905G02	**capacitor, fixed; uF: ±10%; 80 V:** unless otherwise stated .022
C2	23-83606L01	100 ± 75-10%; 25 V
C3, 4	8-82905G02	.022
CR5	48-82992B03	**semiconductor device, diode: (see note)** silicon
Q1, 2	48-86964Z	**transistor: (see note)** NPN; type M9642
R1	6-125A41	**resistor, fixed: ± 5%; 1/2 W:** unless otherwise stated 470
R2	6-125A53	1.5k
R3	6-125A13	33
R4	17-82177B40	200; 5 W
R5, 6	6-128C41	470 ± 10%; 1 W
R7, 8	6-125A49	1k
R9, 10	6-125C73	10k ± 10% (note: Use is optional, determined at factory)
R11	6-125C51	1.2k ± 10%
VR1	48-83695E01	**semiconductor device, diode: (see note)** silicon; Zener type; 6.8 V ± 5%

note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.

parts list

TRN6282A Power Supply Chassis — PL-3349-I

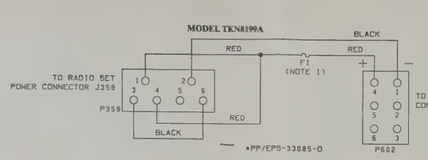
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C1	23-82484C08	**capacitor, fixed:** 11,000 uF + 75-10%; 35 V
CR1	48-84571H02	**semiconductor device, diode: (see note)** Bridge Rectifier Assembly; silicon
J1		**connector, receptacle:** Includes:
	15-10183A53	INSULATOR, 6-contact
	29-82338A01	CONTACT, female; 4 req'd. (plo Model TLN5719A)
F1	65-43092	**fuse, cartridge:** fast-blow type; 2A
P1	30-83212F01	**line cord:** Includes: ac plug
Q3	48-869607	**transistor: (see note)** PNP; type M9607
Q4	48-869639	NPN; type M9639
S1	40-84241G04	**switch, slide:** dpst
T1	25-83584E02	**transformer, power:** pri: res, 2.75 ohms sec: res 0.11 ohm
TB1	31-121700	**terminal strip:** 8-terminals: no. 2 & 7 mtg.
XF1	9-82083C01	**fuseholder:** extractor post type
		non-referenced items
	1-80745B56	WIRE & LUG ASSEMBLY, includes:
	29-824456	LUG, ring tongue
	3-2977	SCREW, machine; 6-32 x 1-1/8"; 4 req'd.
	4-7560	WASHER, flat; .140 x .312 x .027"; 4 req'd.
	4-7800	WASHER, lock; #6 (split); 2 req'd.
	4-84496C01	WASHER, shoulder; 4 req'd.
	26-84922B05	HEATSINK
	29-5248	LUG, soldering; #6; 2 req'd.
	1-80745B57	DIODE BRACKET ASSEMBLY Includes:
	1-80745B58	WIRE & LUG ASSEMBLY Includes:
	29-824456	LUG, ring tongue
	1-80745B59	WIRE & LUG ASSEMBLY, Includes:
	29-824456	LUG, ring tongue
	1-80745B60	WIRE & LUG ASSEMBLY, Includes:
	29-824456	LUG, ring tongue
	1-80745B61	WIRE & LUG ASSEMBLY, Includes:
	29-824456	LUG, ring tongue
	3-134188	SCREW, tapping; 4-40 x 7/16"; 2 req'd.
	4-114057	WASHER, flat; .125 x .312 x .032"
	7-83095F02	BRACKET, circuit board
	14-84268A01	INSULATOR, transistor; 520 x .860"
	14-84525G01	INSULATOR, transistor (TO66 base)
	29-5281	LUG, soldering; #6; 2 req'd.
	29-5369	LUG, soldering; #4
	1-80745B88	HOUSING ASSEMBLY, Includes:
	13-868710	DECAL, patent
	15-83096F02	HOUSING
	1-80778B37	CHASSIS ASSEMBLY, Includes:
	1-80747B60	WIRE & LUG ASSEMBLY, Includes:
	29-82336A01	CONTACT, female
	1-80747B61	WIRE & LUG ASSEMBLY, Includes:
	29-82336A01	CONTACT, female
	1-80747B62	WIRE & LUG ASSEMBLY, Includes:
	29-82336A01	CONTACT, female
	1-80747B63	WIRE & LUG ASSEMBLY, Includes:
	29-82336A01	CONTACT, female
	2-1355	NUT, hex; 8-32 x 5/16 x 1/8"; 4 req'd
	2-7005	NUT, hex; 6-32 x 1/4 x 3/32"; 14 req'd
	2-9627	NUT, hex; 4-40 x 3/16 x 3/32"; 2 req'd
	2-119813	NUT; 8-32 x 11/32"
	3-2979	SCREW, machine; 8-32 x 3/8"; 7 req'd.
	3-7312	SCREW, machine; 8-32 x 3/4"
	3-7346	SCREW, machine; 8-32 x 3/4"
	3-136085	SCREW, machine; 4-40 x 5/16"; 2 req'd.
	3-490773	SCREW, machine; 6-32 x 9/16"; 4 req'd.
	4-2645	WASHER, lock; #6 (split); 12 req'd.
	4-57445	WASHER, lock; #6 (split); 4 req'd.
	4-114583	WASHER, lock; #4 (split); 2 req'd.
	4-62418B88	WASHER, insulator; .125 x .250 x .010"; 2 req'd.
	13-845390O4	ESCUTCHEON
	27-83252H01	CHASSIS
	42-82018H01	RETAINER, cable
	42-83415C01	CLIP; capacitor mounting
	43-82599A01	SPACER, 4 req'd.
	75-84215A02	BUMPER, recessed; 4 req'd.
	3-139854	SCREW, tapping; 6-32 x 3/8"; 8 req'd.
	3-134188	SCREW, tapping; 4-40 x 1/4"; 2 req'd.
	3-139138	SCREW, tapping; 10-32 x 3/8"; 3 req'd.
	33-84035E05	NAMEPLATE, model number
	42-10217A02	STRAP, cable harness; 3 req'd.
	54-84347M01	LABEL, warning
	9-10454A04	CONN, (YELLOW)

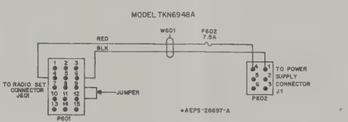
note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.

TKN8199A Power Cable Kit — PL-7636-O

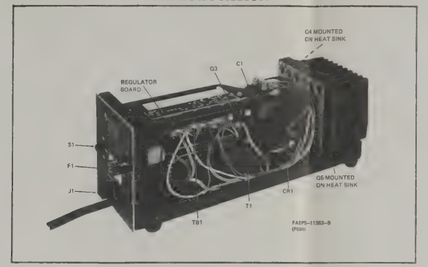
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
F1	65-10266	**fuse:** 10 amp
	or 65-15270	6 amp
P859	15-84182M01	**connector, plug:** HOUSING, 6-contact
P602	15-10183A52	HOUSING, 6-contact
		mechanical parts
	1-80737D31	assembly power cable; Includes:
	14-82883A01	CAP, fuse holder
	42-82884A01	CLIP, fuse
	29-82335A01	TERMINAL, male
	30-84396L02	CABLE, 2-conductor
	37-134370	TUBING, heatshrink; 3/4" (BLK)
	37-134371	TUBING, heatshrink; 3/8" (BLK)
	9-82845L01	CRIMP, connector
	1-80737D32	ASSEMBLY, red wire and lug; Includes:
	9-84151B03	RECEPTACLE, single contact
	1-80737D33	ASSEMBLY, red wire and lug; Includes:
	14-82882A01	BODY, fuseholder
	29-82335A01	TERMINAL male
	41-82885A01	TERMINAL, fuseholder
	42-82884A01	CLIP, fuseholder

CABLE DETAILS





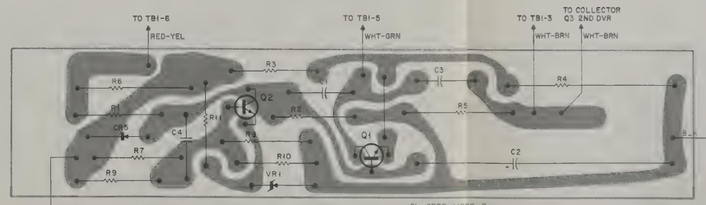
PARTS LOCATION



MODEL TABLE

Model	Sub-Model	Description
TPN1136A	TLN5274B	Regulator Board
	TRN6282A	Power Supply Chassis
TKN6948A		Power Cable (*Maxar*)
TKN6949A		Power Cable (*Maxar-80*)
TKN8199A		Power Cable (*MCX100*)

REGULATOR BOARD DETAIL

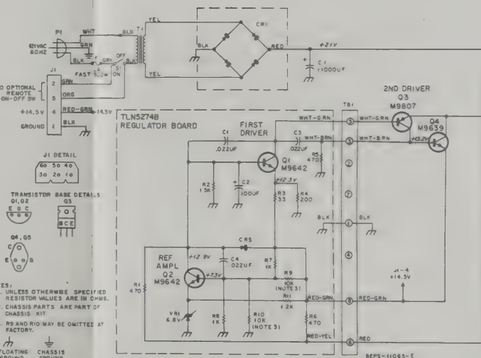


SHOWN FROM SOLDER SIDE

BASE STATION POWER SUPPLY
MODEL TPN1136A
POWER CABLES
MODELS TKN6948A, TKN6949A, AND TKN8199A

FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 120 V ac primary power fixed installation.



BASE STATION POWER SUPPLY AND POWER CABLES/UNIFIED CHASSIS

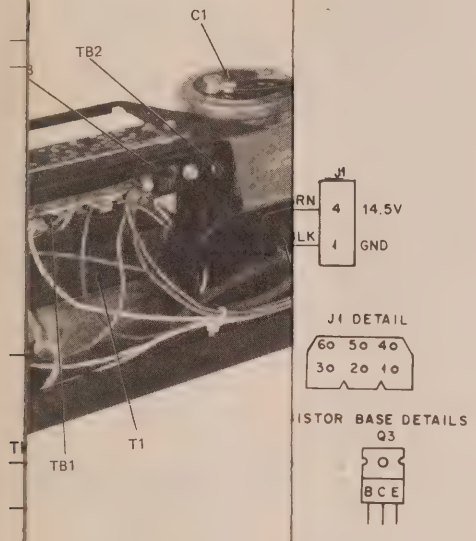
68P81029E96-N
9/3/82-PHI

BASE STATION POWER SUPPLY

MODEL TPN1154A

POWER CABLE

MODELS TKN6948A, TKN6949A AND TKN8199A

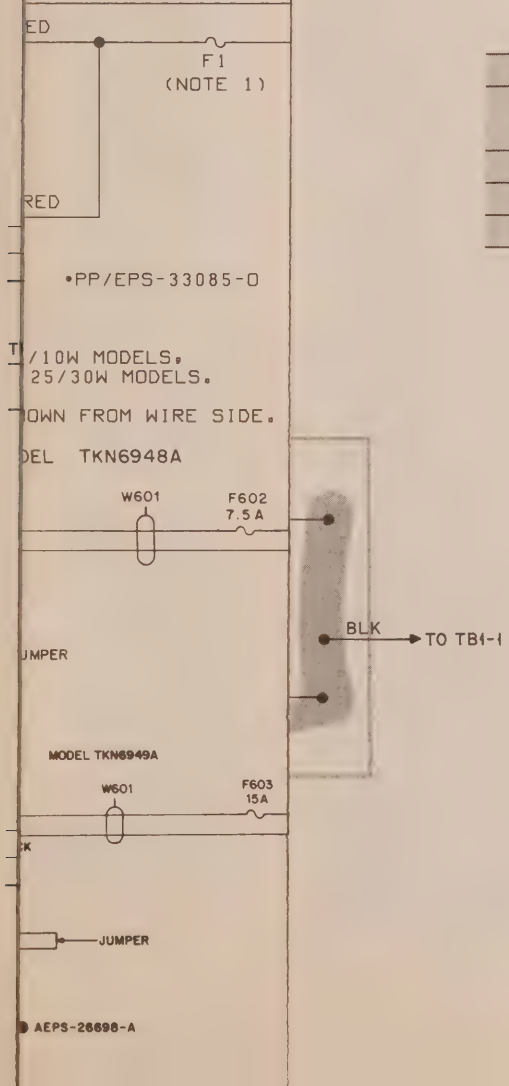


FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 121 V ac primary power fixed installation.

MODEL TABLE

MODEL	SUB-MODEL	DESCRIPTION
TPN1154A	TLN5274B	REGULATOR BOARD
	TRN6561A	POWER SUPPLY CHASSIS
TKN6949A		POWER CABLE (*MAXAR* 80)
TKN8199A		POWER CABLE (*MCX100*)
TKN6948A		POWER CABLE (*MAXAR*)



68P81034E86-L
1/19/83- *PHI*

parts list

TKN8199A Power Cable Kit — PL-7636-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse
F1	85-10286	10 amp
	or 65-15270	6 amp
		connector, plug:
P350	15-84192M01	HOUSING, 6-contact
P602	15-10183A52	HOUSING, 6-contact
		mechanical parts
	1-80737D31	assembly power cable; includes:
	14-82883A01	CAP, fuse holder
	42-82884A01	CLIP, fuse
	29-82335A01	TERMINAL, male
	30-84366L02	CABLE, 2-conductor
	37-13437D	TUBING, heatshrink; 3/4" (BLK)
	37-13437I	TUBING, heatshrink; 3/8" (BLK)
	8-82845J01	CRIMP, connector
	1-80737D32	ASSEMBLY, red wire and lug; includes,
	5-84151P03	RECEPTACLE, single contact
	1-80737D33	ASSEMBLY, red wire and lug; includes
	14-82882A01	BODY, fuseholder
	29-82335A01	TERMINAL, male
	41-82885A01	TERMINAL, fuseholder
	42-82884A01	CLIP, fuseholder

TKN6948A Power Cable Kit — PL-6084-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F602	65-86099	7.5 amp; 32 V; type 3AG; fast-blow
		connector, plug:
P601		Includes:
	15-83293K01	INSULATOR, connector; 15-circuit
	29-84706E05	TERMINAL, pin; male; 4 used
	30-10286A21	WIRE, jumper; BLK
P602		Includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W501	30-84366L01	2-conductor; (18 ga.); 120" used
		fuseholder, in-line:
XF602		Includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-13437I	TUBING, heatsink (BLK) 1" length; 2 used

TKN6948A Power Cable Kit — PL-6085-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		fuse, cartridge:
F603	65-4185	15 amp; 35 V; fast-blow type
		connector, plug:
P601		Includes:
	15-83958L01	INSULATOR, connector; 17-circuit
	29-82335A01	TERMINAL, pin; male; (large) 2 used
	29-84706E05	TERMINAL, pin; male; (small) 6 used
	30-10286A21	WIRE, jumper; BLK
P602		Includes:
	15-10183A52	INSULATOR, connector; 6-circuit
	29-82335A01	TERMINAL, pin; male; 4 used
		cable, power:
W501	30-84366L02	2-conductor; (14 ga.); 120" used
		fuseholder, in-line:
XF603		Includes:
	14-82882A01	BODY, fuseholder
	14-82883A01	CAP, fuseholder
	41-82885A01	SPRING, compression
	42-82884A01	CLIP, fuseholder; 2 used
		non-referenced part
	37-13437I	TUBING, heatsink (BLK) 1" length; 2 used

TRN6561A Power Supply Chassis — PL-5362-G

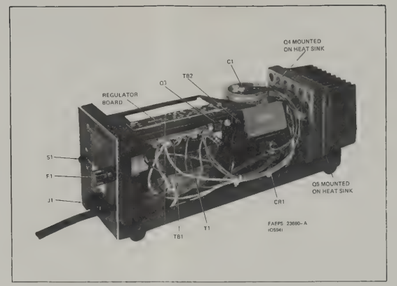
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C1	23-82464C10	25,000 uF + 75-10%; 40 V
		semiconductor device:
		diode: (see note)
CR1	48-84571H02	Bridge Rectifier Assembly, silicon
		connector, receptacle:
J1		includes:
		15-10183A53 INSULATOR, 6-contact
		29-82336A01 CONTACT, female, 2 req'd.
		fuse, cartridge:
F1	65-52293	fast-blow type; 5 A
		line cord:
P1	30-83212F01	includes
		ac plug
		transistor: (see note)
Q3	48-869807	PNP; type M9807
Q4, 5	48-869639	NPN, type M9639
		switch, slide:
S1	40-84241G04	DPST
		resistor, fixed:
R12, 13	17-82177B50	0.1 ± 10%, 7 W
		transformer, power:
T1	25-84638C02	pri: res. 4.9 ohms (240 volt configuration)
		sec: res: 0.035 ohms
		terminal strip:
TB1	31-121700	8 terminals; No. 2 & 7 mtg
TB2	31-898341	4 terminals, screw
		fuseholder:
XF1	9-82083C01	extractor post type
		non-referenced items
	37-13437I	TUBING, heatshrink BLK 1" length; 2 used
	1-80794B62	HEAT SINK ASSEMBLY
	1-80745B56	WIRE & LUG ASSEMBLY, includes:
	29-82445K	LUG, ring tongue
	1-80794B63	TRANSISTOR & LUG ASSEMBLY, 2 req'd. includes:
	4-474216	WASHER, insulator; 2 req'd.
	14-665854	INSULATOR, transistor
	29-84489B01	LUG, transistor; 2 req'd. tused with Q4 & Q5)
	2-7005	NUT, hex; 6-32 x 1/4 x 3/32"; 10 req'd.
	2-2077	SCREW, machine; 6-32 x 1-1/8"; 4 req'd.
	4-7569	WASHER, flat; .145 x .312 x .027"; 2 req'd.
	4-7650	WASHER, lock; #6 (split); 2 req'd.
	4-84496C01	WASHER, shoulder; 4 req'd.
	26-84923B06	HEAT SINK
	29-5248	LUG, soldering; #6, 2 req'd
	31-490161	TERMINAL STRIP; #1 mtg; 2 req'd.
	1-80794B64	DIODE BRACKET ASSEMBLY, includes
	1-80745B56	WIRE & LUG ASSEMBLY, includes
	29-82445K	LUG, ring tongue
	1-80745B58	WIRE & LUG ASSEMBLY, includes:
	29-82445K	LUG, ring tongue
	1-80745B60	WIRE & LUG ASSEMBLY, includes:
	29-82445K	LUG, ring tongue
	1-80745B61	WIRE & LUG ASSEMBLY, includes:
	29-82445K	LUG, ring
	1-80795B10	WIRE & LUG ASSEMBLY, includes:
	29-812979	LUG, crimp terminal
	2-121841	NUT, hex; 8-32 x 5/16 x 7/64"; 2 req'd.
	3-134186	SCREW, tapping 4-40 x 1/4"; 2 req'd.
	3-134268	SCREW, tapping 4-40 x 7/16"; 2 req'd.
	3-138341	SCREW, machine; 6-32 x 5/8"; 2 req'd.
	4-114057	WASHER, flat; .125 x .312 x .032"
	4-821633	WASHER, shoulder
	7-83095F02	BRACKET, circuit board
	14-83275L01	INSULATOR, grid
	14-84268A01	INSULATOR,transistor
	14-84525G01	INSULATOR, transistor (TO66 Base)
	29-5261	LUG, soldering, 2 req'd
	29-5369	LUG, soldering

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	1-80794B65	HOUSING ASSEMBLY,includes:
	15-83296L02	HOUSING COVER
	1-80794B66	CHASSIS ASSEMBLY, includes:
	1-80747B60	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	TERMINAL, female
	9-10454A04	connector
	1-80747B61	WIRE & LUG ASSEMBLY, includes:
	29-82336A01	TERMINAL, female
	1-80794B67	TRANSFORMER & LUG ASSEMBLY, includes
	29-812979	LUG, crimp terminal
	2-119913	NUT, 8-32 x 11/32"
	2-9627	NUT, hex; 4-40 x 3/16 x 3/32"; 2 req'd
	3-7312	SCREW, machine; 8-32 x 3/4"
	3-2979	SCREW, machine; 6-32 x 3/8"; 3 req'd
	3-7346	SCREW, machine; 6-32 x 3/4";
	3-138143	SCREW, tapping; 8-32 x 1/4"; 4 req'd.
	3-139085	SCREW, machine; 4-40 x 5/16"; 2 req'd
	3-140773	SCREW, machine; 6-32 x 9/16"; 4 req'd
	4-2645	WASHER, lock; #5 (split); 4 req'd.
	4-7657	WASHER, lock; #8 (split); 4 req'd.
	4-114583	WASHER, lock; #4 (split); 2 req'd.
	4-82418B88	WASHER, insulator
	7-83158L01	BRACKET
	13-84639D05	ESCUTCHEON
	27-83282N01	CHASSIS
	42-82013H01	RETAINER, cable
	75-84215A02	BUMPER, recessed
	3-2979	SCREW, machine; 6-32 x 3/8"; 4 req'd
	3-139854	SCREW, tapping; 6-32 x 3/8"; 8 req'd
	3-134168	SCREW, tapping; 4-40 x 1/4"; 2 req'd
	3-139138	SCREW, tapping; 10-32 x 3/3"; 3 req'd.
	4-2645	WASHER, lock; #5 (split); 4 req'd.
	42-10217A02	STRAP, cable harness, 3 req'd.

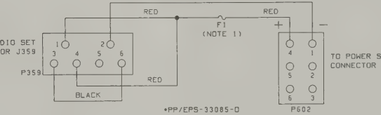
TLN5274B Regulator Board — PL-5361-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed; uF: ± 10%; 50 V:
		unless otherwise stated
C1	8-82905G02	.022
C2	23-83998L01	100 + 75-10%; 25 V
C3, 4	8-82905G02	.022
		semiconductor device, diode: (see note)
CR5	48-82392B03	silicon
		transistor: (see note)
Q1, 2	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/2 W:
		unless otherwise stated
R1	6-125A41	470
R2	6-125A53	1.5k
R3	6-125A13	33
R4	17-82177B40	200; 5 W
R5, 8	6-126C41	470 ± 10%; 1 W
R7, 8	6-125A49	1k
R9, 10	6-125C73	10k ± 10% (note: Use is optional, determined at factory)
R11	6-125C51	1.2k ± 10%
		semiconductor device, diode: (see note)
VR1	48-83696E01	silicon; Zener type; 6.8 V ± 5%

note: Replacement diodes and transistors must be ordered by listed part number only for optimum performance.

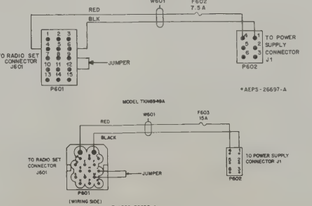


CABLE DETAILS
MODEL TKN8199A

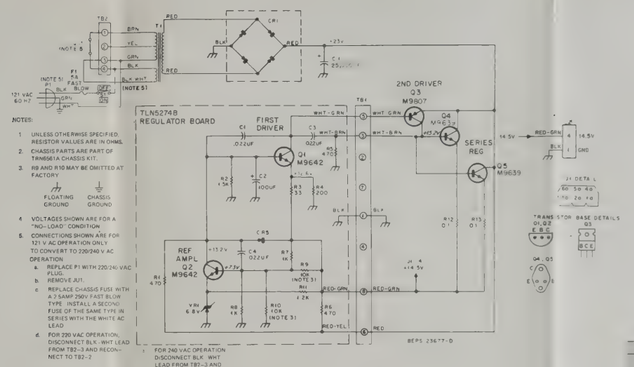


NOTES
1. F1 IS 6A IN E/10W MODELS. 10A IN 25/30W MODELS.
2. CONNECTORS SHOWN FROM WIRE SIDE.

MODEL TKN6948A

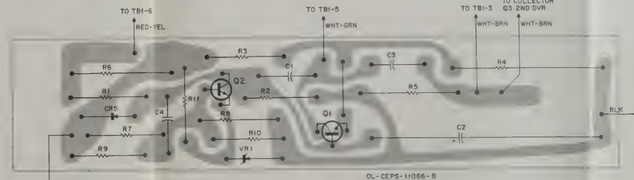


TPN1154A POWER SUPPLY SCHEMATIC DIAGRAM



NOTES:
1. UNLESS OTHERWISE SPECIFIED RESISTOR VALUES ARE IN OHMS.
2. CHASSIS PARTS ARE PART OF TRN6561A CHASSIS KIT.
3. R8 AND R10 MAY BE OMITTED AT FACTORY.
4. VOLTAGES SHOWN ARE FOR A "NO-LOAD" CONDITION
5. CONNECTIONS SHOWN ARE FOR 121 V AC OPERATION ONLY. TO CONVERT TO 220/240 V AC OPERATION:
   a. REPLACE P1 WITH 220/240 VAC PLUG.
   b. REMOVE JU1.
   c. REPLACE CHASSIS FUSE WITH A 3 AMP 250V FAST BLOW TYPE. INSTALL A SECOND FUSE OF THE SAME TYPE IN SERIES WITH THE WHITE AC LEAD.
   d. FOR 220 VAC OPERATION, DISCONNECT BLK-WHT LEAD FROM TB2-3 AND RECONNECT TO TB2-2.

TLN5274B REGULATOR CIRCUIT BOARD DETAIL



SHOWN FROM SOLDER SIDE

BASE STATION POWER SUPPLY
MODEL TPN1154A
POWER CABLE
MODELS TKN6948A, TKN6949A AND TKN8199A

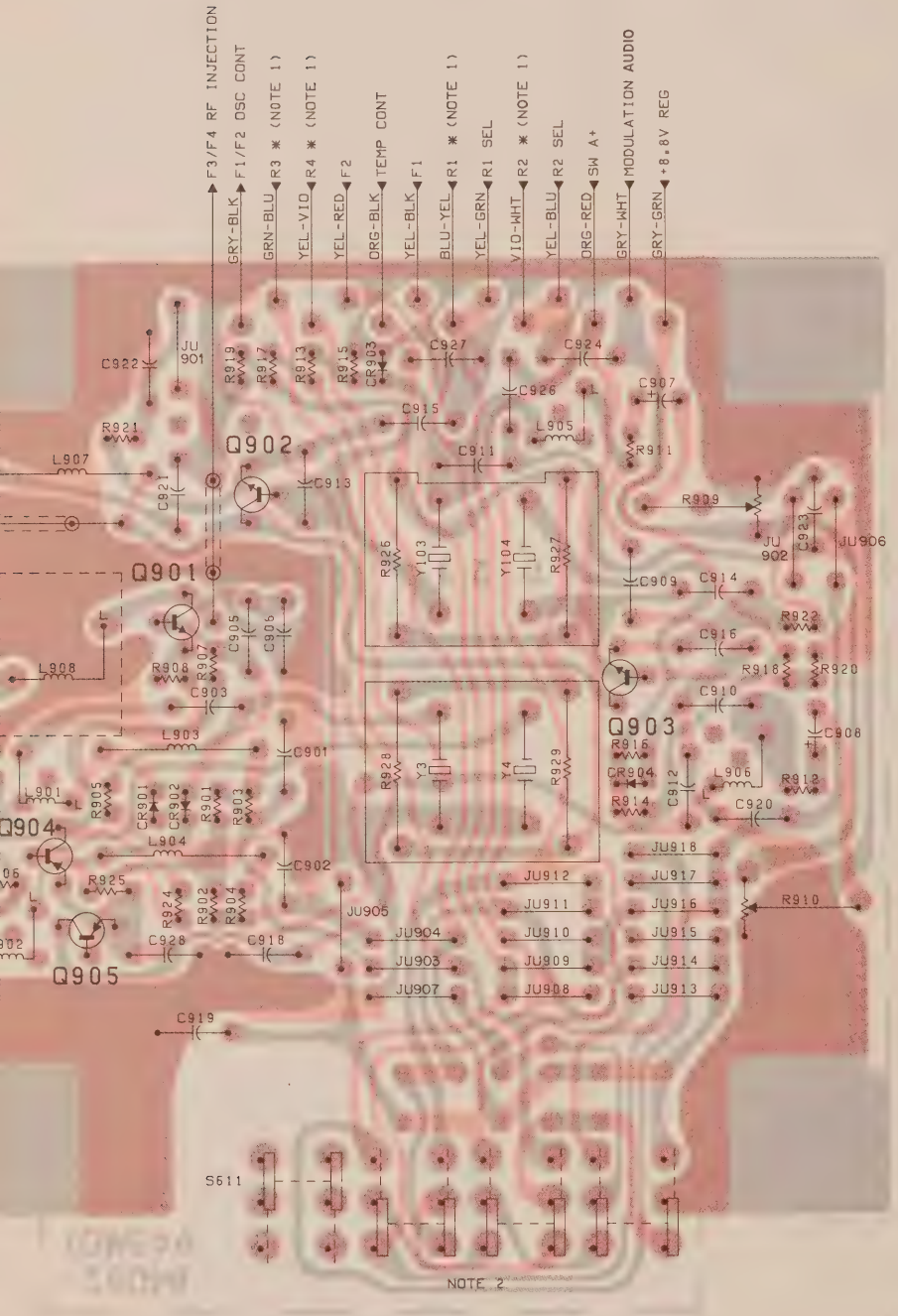
FUNCTION

Provides the entire radio with regulated +14.5 V dc when used in a 121 V ac primary power fixed installation.

MODEL TABLE

MODEL	SUB-MODEL	DESCRIPTION
TPN1154A	TLN5274B	REGULATOR BOARD
	TRN6561A	POWER SUPPLY CHASSIS
TKN6949A		POWER CABLE (*MAXAR* 80)
TKN8199A		POWER CABLE (*MCX100*)
TKN6948A		POWER CABLE (*MAXAR*)

FOUR-FREQUENCY BOARD



TRANSISTOR
BASE DETAIL

M9494/22N39
M9932, M9643
Q901, Q902,
Q903, Q904,
Q905

NOTES

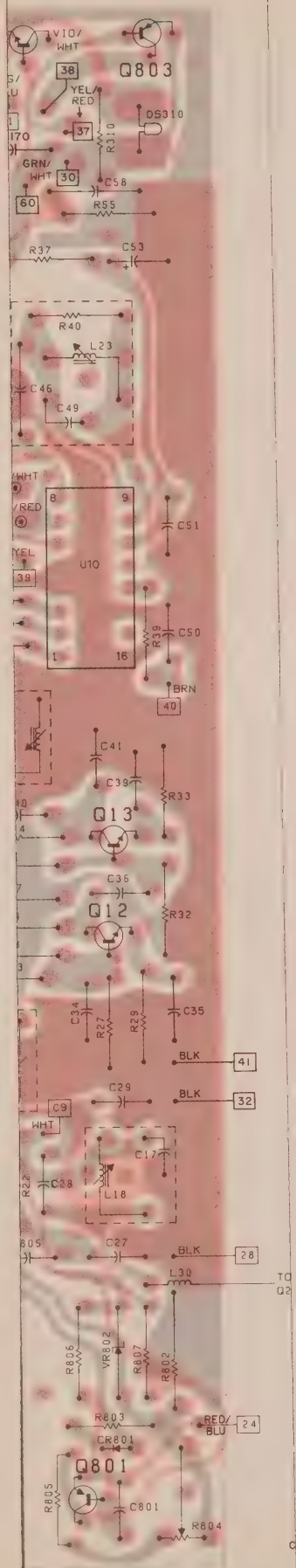
1. DENOTES MULTI-CODE CONNECT POINTS USED ONLY WITH MULTI-CODE OPTION
2. SWITCHES SHOWN IN 'F1' POSITION
3. "L" DENOTES LOW END OF COIL

COMPONENT SIDE BD-DEPS-28309-O
SOLDER SIDE BD-DEPS-28310-O
OL-DEPS-28308-C

SHOWN FROM SOLDER SIDE

UNIFIED CHASSIS

CIRCUIT BOARD DETAIL



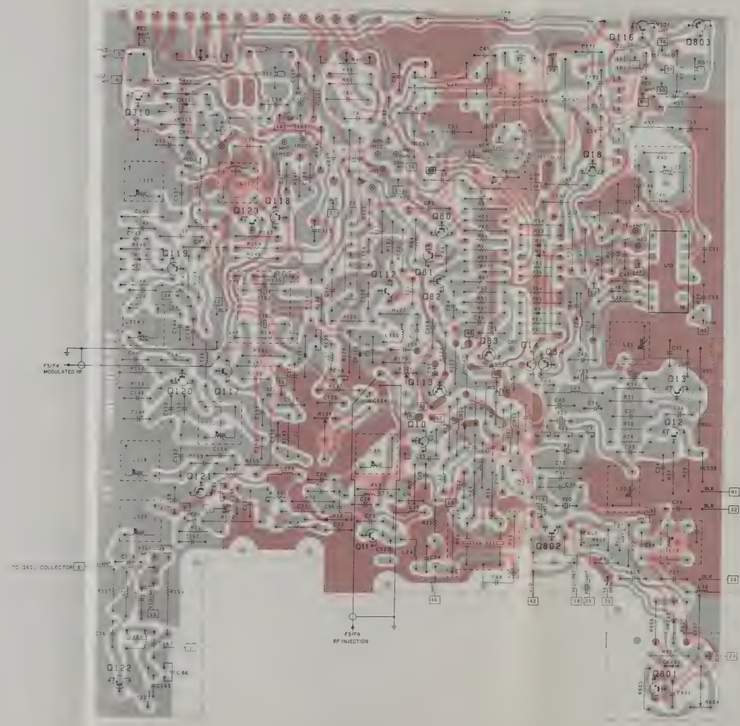
UNIFIED CHASSIS
CIRCUIT BOARD DETAILS

PUSH-PIN TABLE	
PIN WIRE COLOR	FUNCTION
P. C. BOARD CONNECTIONS (WHEN USED):	
C RED/WHT	SWITCHED A+ TO PL BOARD
D WHT/RED	PL TONE TO PL BOARD DECODER INPUT
E YEL/WHT	AUDIO TO PL BOARD HIGH-PASS FILTER INPUT
F YEL/BLU	AUDIO FROM PL BOARD HIGH-PASS FILTER OUTPUT
G GRA	SQUELCH CONTROL FROM PL BOARD SQUELCH SWITCH
M GRN/BRN	MIC PTT TO PL BOARD PTT INPUT
N GRN/WHT	DELAYED PTT FROM PL BOARD
P BRN/ORG	PL TONE FROM PL BOARD ENCODER OUTPUT
T BLK	PL BOARD GROUND
MICROPHONE CONNECTIONS:	
V RED	AUDIO HIGH
W BLK	AUDIO LOW
X WHT	PTT GROUND
Y GRN	PTT
Z BRN	RCVR AUDIO

EPS-19728-A

JUMPER TABLE		
JUMPER NUMBER	IN	OUT
J01,J0101	SINGLE-FREQUENCY RECEIVER MODELS	MULTIPLE-FREQUENCY RECEIVERS
J02,J0102	CARRIER SQUELCH MODELS	"PRIVATE-LINE" SQUELCH MODELS
J0104	9PIN BASE STATION MODELS	2 PIN MOBILE MODELS
J0201	NORMALLY HI FOR POWER-ON INDICATOR	EXT/HIGHSIGNAL POWER-ON INDICATOR OR USED WITH QUIK-CALL OPTION

EPS-23697-B



LATER VERSION
UHF MAIN BOARD
CIRCUIT BOARD DETAIL

SHOWN FROM SOLDER SIDE

XMTR BASE DETAILS

Q10,12,13,117,118,119-M9494/M9932/22N39
Q14,80,81,82,83,84,113-M9642
Q18-M9571
Q112,123,310,801,802,804-M9643
Q120-M9987

Q11-M9658

Q121-M9657

Q122-M9887

Q211-M9533

Q116-M9640

Q803-M9647

NOTES
1. –[18]– INDICATES MAIN PRINTED CIRCUIT BOARD WIRING REFER TO TABLE 1 FOR DETAILS.
2. BUBBLE HEAD PINS (DENOTED BY Ⓞ) ARE LABELED FOR JUMPER WIRE COLOR AND USED FOR "PRIVATE-LINES" AND MICROPHONE CONNECTIONS

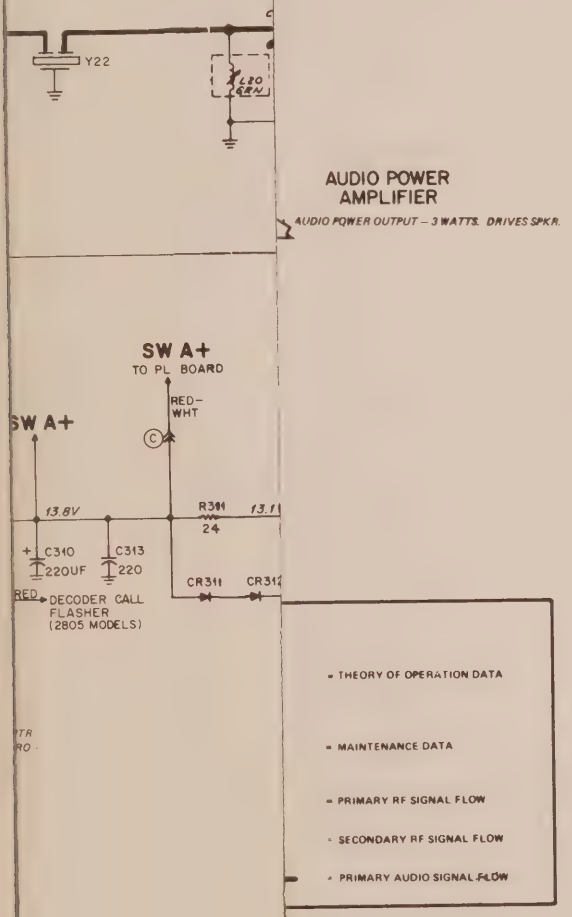
NO.	FUNCTION	ON-BOARD SOURCE	COLOR	OFF-BOARD DESTINATION	REMARKS
1	RF INPUT TO TRIPLER FILTER	C163	—	C216	SLEEVED WIRE
2	SW A+	R158	RED–WHT*	—	FROM 5
3	SW A+ TO S801 VIA J601-7	R311	RED–WHT*	J601-7	
4	SW A+ TO Q804 EMITTER	R311	RED–WHT	—	TO 62
5	SW A+ TO RF AMP	R311	RED–WHT*	—	TO 3
6	A+	CR310	RED	TO S311	
7					
8	DRIVER CONTROLLED A+	C168	VIO–WHT	Q601 COLLECTOR	
9	TO 38	C168	VIO–WHT*	—	
10	RCVR INJECTION	C52		TO PRESELECTOR	SLEEVED WIRE
11	F2	C133	YEL–RED	S612-A	
12	C310 GND	C310	BLK		TO 32
13	PTT	C83	WHT–GRN	—	S.M.T/TOT
14	PTT	J4102	WHT–RED*	C629	FOR ANTENNA SWITCH
15	F1	C129	YEL–BLK	S611-A	
16	MIC AUDIO	C110	WHT–GRN*	TO J601-5	
17	R2 SEL	C11	YEL–BLU	S612-B	F2 MODELS ONLY
18	—	Q802 EMITTER	YEL–RED*	—	TO 37
19	RCVR HEATERS	R159	ORG–BLU	—	FROM NO. 51
20	RCVR AUDIO	R80	BLK–WHT*	J601-9	
21	SPEAKER GND	C65	BLK*	LS601	
22	SPEAKER AUDIO	R60	BLU*	LS601	
23	RCVR AUDIO	C70	WHT*	J601-12	
24	THERMAL SHUTBACK	C801	RED–BLU*	TO C633	FEED THROUGH CAP
25	A+	R801	YEL–BRN*	TO FINAL PA	
26	A+	R808	RED–WHT*	DRIVER STAGE; FINAL PA	
27	A+	R808	RED–WHT	FROM S801	
28	MIXER GND	C27	BLK	MIXER BOARD	
29	RF AMP SW A+	R22	WHT	TO RF AMP BOARD	
30	A+	R880	GRN–WHT*	—	FROM 53
31	RCVR HEATERS	22-11	ORG–BLUE	—	TO 28
32	C310 GND	C29	BLK	—	TO 7
33	XMTR METER 5	R162	GRN–WHT	J601-11	
34	XMTR METER 3	R147	ORG	J601-14	
35	R1 SEL	C90	YEL–GRN	S611A	
36	PTT	J4102	GRN*	TO J601-8	
37	—	Q803 BASE	YEL–RED	—	TO 13
38	TO 9	Q802 COLLECTOR	VIO–WHT*	—	
39	RCVR METER 2	R42	YEL*	J601-13	
40	RCVR METER 1	C80	BRN*	J601-10	
41	GND		BLK*	J601-6	
42	MTR 7	R808	VIO*	J601-15	
43	A+	CR311	RED–WHT	FROM S801	
44	XMTR GND	C87	GRN	FREQUENCY SWITCH	
45	RCVR HEATER JUMPER	C87	WHT*	—	TO 46
46	RCVR HEATER JUMPER	R69	WHT*	—	FROM 45
47	INHIBIT	Q802 BASE	BRN–YEL	—	—
48	A+	R57	RED–WHT	—	—
49	GND	C87	BLK	—	—
50	TONE	C66	BRN	—	—
51	—			—	—
52	DISCRIM OUTPUT	R42	YEL	STATUS MESSAGE TERMINAL	
53	GND	—	BLK	STATUS MESSAGE TERMINAL	
54	DISCRIM AUDIO MTR3	R147	ORG	STATUS MESSAGE TERMINAL	
55	TRIPLER CONTROL VOLTAGE	R159	VIO–WHT*	—	TO 56
56	TRIPLER CONTROL	Q802 COLLECTOR	VIO–WHT*	—	TO 55
57	8.5V DC REG	R11	GRY–GRN	4 FREQ BOARD	—
58	F1/F2 OSC. CONT.	R15	GRY–BLK	4 FREQ BOARD	—
60	SW A+	R310	ORG–RED	4 FREQ BOARD	—
59	F3/F4 TEMP CONT.	C87	ORG–BLK	4 FREQ BOARD	—
61	MODUL. AUDIO	R126	GRY–WHT	4 FREQ BOARD	—
62	SW A+	R311	RED–WHT		FROM 4
63	A+	R880	GRN–WHT		TO 50

SOLDER SIDE ⓢ80-EEPS-33779-O
COMPONENT SIDE 80-EEPS-33780-O
OL-EEPS-34116-A

*P/O WIRING HARNESS

UNIFIED CHASSIS

RECEIVER SECTION
ONE AND TWO-FREQUENCY MODELS



FUNCTION

Amplifies, mixes, filters, and demodulates received rf energy from antenna (via antenna switch) and provides an amplified audio signal to the speaker.

parts list

TRN8465A 4-Freq. Escutcheon — PL-6499-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		mechanical parts
	2-10101A78	NUT, spring; 2 used
	13-84512L40	ESCUTHEON
	15-84969L04	COVER
	38-84514L01	BUTTON, push; 4 used

legend
L = 450-470 MHz
M = 470-494 MHz
H = 494-512 MHz

TLE5193A 4-Frequency Board (450-470 MHz)
TLE5194A 4-Frequency Board (470-494 MHz)
TLE5195A 4-Frequency Board (494-512 MHz) — PL-6492-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ± 5%; 500 V: unless otherwise stated
C901, 902	21-82428B25	.002 uF ± 20%
C903L, 904L	21-840845	24; N220
C903M, 904M	21-82204B53	15
C903H, 904H	21-82610C30	62
C905L, M, H	21-82133G77	18
C906	21-82610C30	68; 200 V
C907, 908	23-84665F01	10 uF; + 100 + 10%; 25 V
C909, 910	21-850510	470 ± 10%; 300 V
C911L, M, C912L, M	21-82204B51	62
C911H, 912H	21-82610C21	62; 200 V
C913, 914	21-84494B52	91
C915, 916	21-84494B15	300
C917 thru 920	21-83596E10	220 ± 20%
C921M, H	21-82372C10	.05 uF; 25 V
C922, 923	21-82428B04	.01 uF + 70-30%; 100 V
C924	21-83596E10	220 ± 20%
C925L	21-859211	47
C925M, H	21-861439	345 ± 10%; 75 V
C926, 927, 928	21-83596E10	220 ± 20%
C929	23-84665F05	4.7 uF + 150-10%; 25 V
		diode: (see note)
CR901, 902	48-83510F03	silicon
CR903, 904	48-82190H13	varactor
		coil, rf:
L901, 902	24-83601K01	18-1/2 turns
L903, 904	24-82835G20	9.3 uH
L905, 906	24-83601K01	18-1/2 turns
L907M, H	24-82835G13	0.82 uH
L908L, M	24-84972A56	5-1/2 turns
L908H	24-84972A48	4-1/2 turns
		transistor: (see note)
Q901, 902, 903	48-82022N39	NPN; type 22N39
Q904, 905	48-869643	PNP; type M9643
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R901, 902	6-11009C87	39k
R903, 904	6-11009C51	1.2k
R905, 906	6-11009C45	680
R907	6-11009C64	4.3k
R908	6-11009C39	390
R909, 910	18-84944C02	var. 25k
R911, 912	6-11009C67	5.6k
R913, 914	6-11009D04	180k
R915, R916	6-11009D02	150k
R917, R918	6-11009C65	4.7k
R919, 920	6-11009C75	12k
R921, 922	6-11009C49	1k
R923	6-11009C57	2.2k
R924	6-11009C89	47k
R926 thru 929	6-11009C25	100
		switch, pushbutton:
S611	40-82919L04	4-position, 2-pole, interlocking
		crystal:
Y3, 4	KXN6122AA	receiver
Y103, 104	KXN6121AA	transmitter
		mechanical parts
	1-80713D72	CABLE, assembly (transmitter) includes:
	30-82414K01	CABLE, coaxial; 5" used
	29-10134A90	LUG, terminal
	1-80713D73	CABLE, assembly (receiver) includes:
	30-8241 4K01	CABLE, coaxial; 4-3/4" used
	29-10134A90	LUG, terminal
	29-82348F01	LUG, terminal; 9 used
	9-83487K01	SOCKET, crystal: 4-contact; 2 used
	1-80754D16	SHIELD, coil
	26-83016M01	SHIELD, coil

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TRN6284A Hang-up Box (With Switch) — PL-6491-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch:
S701	40-84622B04	spst; slide
		mechanical parts
	3-139913	SCREW, tapping: 8-18 x 1/2"; 2 used
	38-84383D01	CAP, protective
	42-82018H07	RETAINER, cable
	15-82579M01	HOUSING (hang-up)
	29-128018	LUG, solder
	4-7650	LOCKWASHER, #6 internal
	4-10057A17	WASHER, shoulder
	4-82418B01	WASHER, insulator
	29-5261	LUG, solder
	41-867668	SPRING
	29-84706E05	TERMINAL, crimp: 2 used

THN6347A Housing Kit — PL-6478-F

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		speaker; 3-1/2" square:
LS601	50-83291K01	imped. 4 ohms ± 15%; 5 W max.
		non-referenced parts
	15-84510L01	HOUSING
	36-84511L03	KNOB, control (off volume, squelch)
	41-82644M01	SPRING, knob retaining; 2 used
	33-83654M01	NAMEPLATE
	13-868710	DECAL, patent
	54-863472	LABEL, deviation
	54-865436	LABEL, FCC
	3-140211	SCREW, tapping: 6-32 x 1/4"; 3 used
	3-139990	SCREW, tapping: 0-6 ST x 1/8
	38-84514L01	BUTTON

TRN8427A Escutcheon Kit (1-Freq. Carrier Squelch)
TRN8428A Escutcheon Kit (2-Freq. Carrier Squelch)
TRN8429A Escutcheon Kit (1-Freq. *Monitor*)
TRN8430A Escutcheon Kit (2-Freq. *Monitor*) — PL-6479-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	13-84512L01	ESCUTCHEON (TRN8427A)
	13-84512L02	ESCUTCHEON (TRN8428A)
	13-84512L03	ESCUTCHEON (TRN8429A)
	13-84512L04	ESCUTCHEON (TRN8430A)
	15-84969L05	COVER (TRN8427A)
	15-84969L01	COVER (TRN8428A)
	15-84969L02	COVER (TRN8429A)
	15-84969L03	COVER (TRN8430A)
	38-84514L01	PUSHBUTTON (F1, F2, monitor)
	2-10101A78	NUT, spring

TRN8782A Hardware Kit (Carrier Squelch Models)
TRN8783A Hardware Kit 4-Freq. ("PL" and "DPL" Models) — PL-6489-B

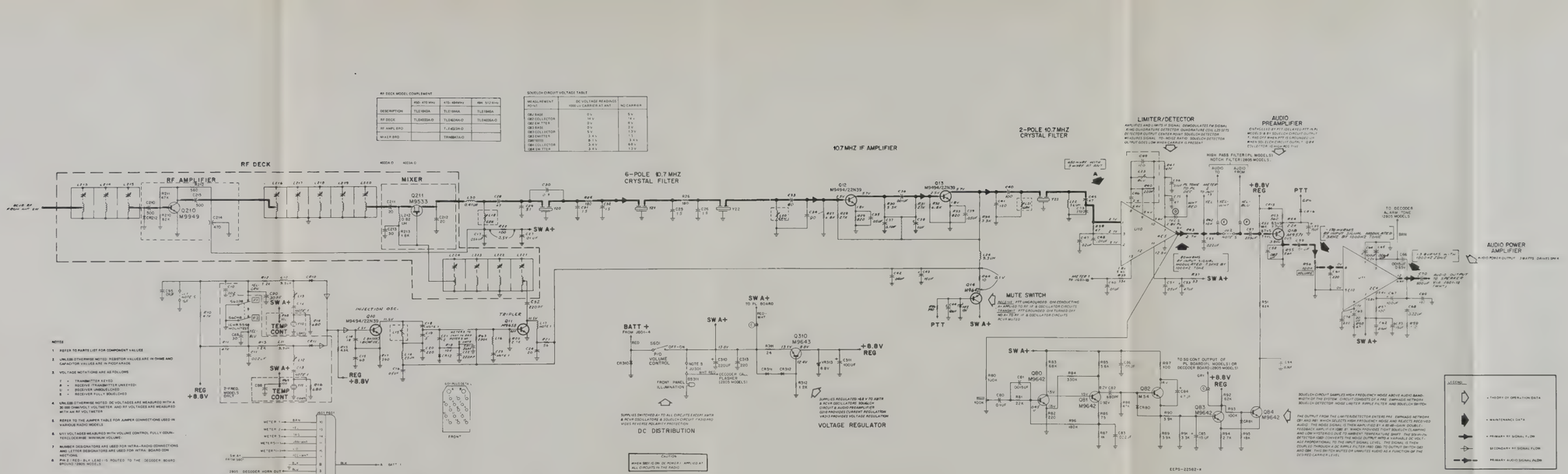
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		mechanical parts
	3-134168	SCREW, tapping: 4-40 x 1/4; 2 used (TRN8782A) or 5 used (TRN8783A)
	3-140212	SCREW, tapping: 6-32 x 5/16"; 4 used
	3-134212	SCREW, tapping: 4-40 x 5/16"; 2 used
	4-7615	WASHER, flat (TRN8782A)
	7-83013M01	BRACKET, circuit board mounting
	7-82954L01	BRACKET, circuit board mounting; 4 used
	29-10261A14	LUG, terminal
	38-82592L01	BUTTON, push: white; 4 used

NOTE:

For remainder of parts lists see page 5 of 8 in this section.

FUNCTION

Amplifies, mixes, filters, and demodulates received rf energy from antenna (via antenna switch) and provides an amplified audio signal to the speaker.



REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION

TLE4033A Rf Deck (450-470 MHz)
TLE4034A Rf Deck (470-494 MHz)
TLE4035A Rf Deck (494-512 MHz)

LEGEND

L = 450-470 MHz
M = 470-494 MHz
H = 494-512 MHz

PL-5390-B

NOTE: This parts list covers three models of the RF Deck. Where differences exist a letter code is added to the reference symbol to indicate the applicable frequency range.

		CAPACITOR, fixed:
C214	21-84760C01	470 pF ±20%; 500V(fed thru type)
C216L, M	21-82785H56	5 pF ±0.5 pF; 1700V
C216H	21-83366K08	4 pF ±0.5 pF; 1700V
		COIL, rf:
L213L	1-80748B40	8 turns; coded orange
L213M	1-80766B07	7-5/8 turns; coded brown-purple
L213H	1-80766B16	7-1/2 turns; coded red-orange
L214L	24-84641G01	8 turns; coded black
L214M	24-84641G20	7-5/8 turns; coded red-black
L214H	24-84641G25	7-1/2 turns; coded red-green
L215L	1-80748B40	8 turns; coded orange
L215M	1-80766B07	7-5/8 turns; coded brown-purple
L215H	1-80766B16	7-1/2 turns; coded red-orange
L216L	1-80748B41	8 turns; coded red
L216M	1-80766B08	7-5/8 turns; coded brown-blue
L216H	1-80766B17	7-1/2 turns; coded red-red
L217L	24-84641G01	7-5/8 turns; coded black
L217M	24-84641G20	7-5/8 turns; coded red-black
L217H	24-84641G25	7-1/2 turns; coded red-green
L218L	24-84641G01	7-5/8 turns; coded black
L218M	24-84641G20	7-5/8 turns; coded red-black
L218H	24-84641G25	7-1/2 turns; coded red-green
L219L	24-84641G01	7-5/8 turns; coded black
L219M	24-84641G20	7-5/8 turns; coded red-black
L219H	24-84641G25	7-1/2 turns; coded red-green
L220L	1-80748B41	8 turns; coded red
L220M	1-80766B08	7-5/8 turns; coded brown-blue
L220H	1-80766B17	7-1/2 turns; coded red-red
L221L	24-80907A46	8 turns; coded blue-blue
L221M	24-80907A47	7-3/4 turns; coded blue-white
L221H	24-80907A48	7-5/8 turns; code blue-gray
L222L	24-84641G01	8 turns; coded black
L222M	24-84641G14	7-3/4 turns; coded brown-yellow
L222H	24-84641G20	7-5/8 turns; coded red-black
L223L	24-84641G01	8 turns; coded black
L223M	24-84641G14	7-3/4 turns; coded brown-yellow
L223H	24-84641G20	7-5/8 turns; coded red-black
L224L	1-80748B46	8 turns; coded brown
L224M	1-80766B10	7-5/8 turns; coded brown-blue
L224H	1-80766B19	7-5/8 turns; coded red-brown
L225L	24-80907A33	8 turns; coded orange
L225M	24-80907A34	7-5/8 turns; coded brown-purple
L225H	24-80907A35	7-1/2 turns; coded red-orange
L226L	24-84641G01	7-5/8 turns; coded black
L226M	24-84641G20	7-5/8 turns; coded red-black
L226H	24-84641G25	7-1/2 turns; coded red-green
L227L	1-80748B40	8 turns; coded orange
L227M	1-80766B07	7-5/8 turns; coded brown-purple
L227H	1-80766B16	7-1/2 turns; coded red-orange
NON-REFERENCED ITEMS		
	1-80796B92	HOUSING ASSEMBLY includes:
	15-84402K03	HOUSING
		CAPACITOR C214
	3-83769N01	SCREW, machine: 4-40 x 3/16"; 15 used
	14-84886A01	INSULATOR, standoff: 2 used
	3-83674N01	SCREW, tapping; 25 used

TRN6846A Hardware Kit, Main Board PL-5394-C

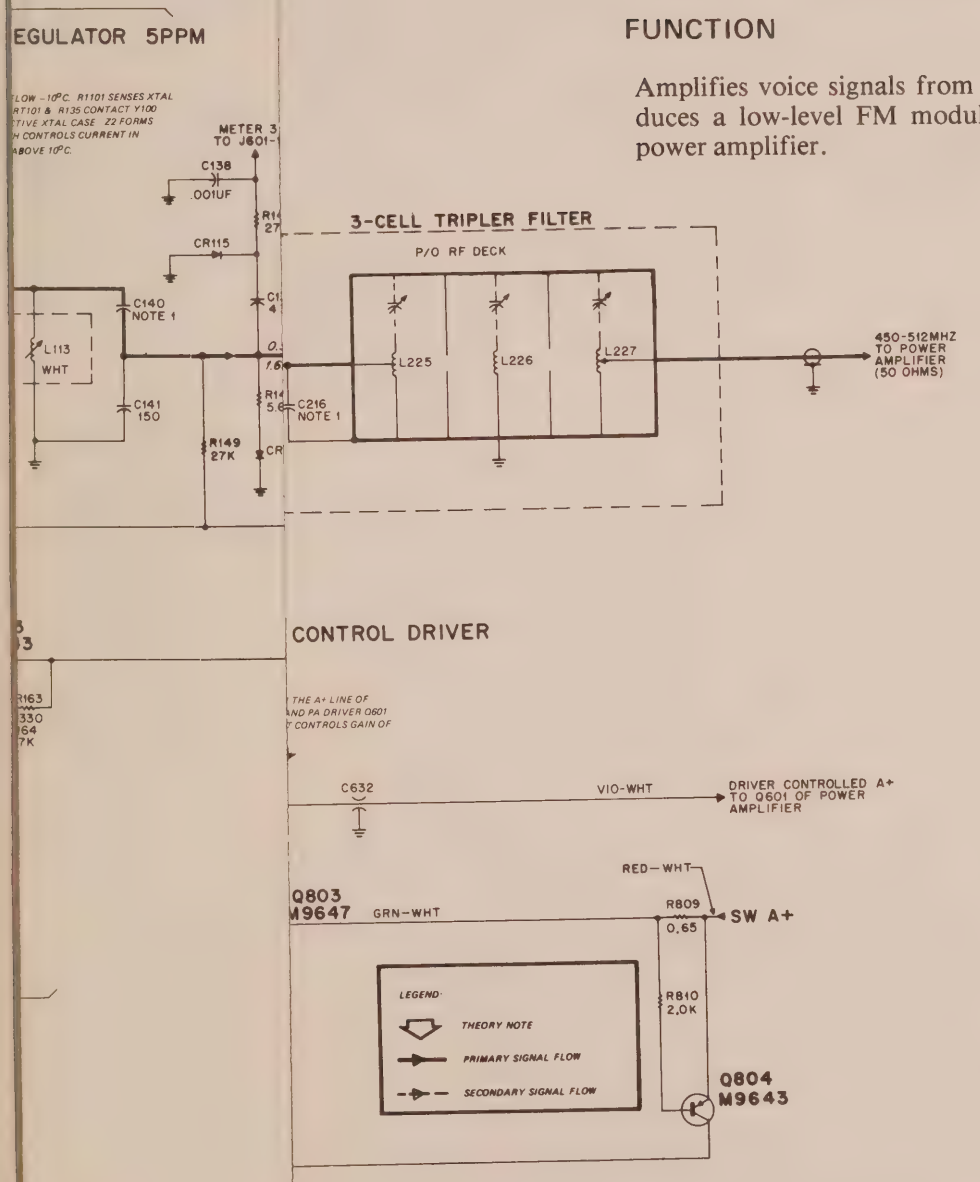
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed:
C629 thru 633	21-861219	1000 pF + 100 – 0%; 500 V (feed thru type)
		lamp:
DS310, 311	65-83376K01	14 V
		mic connector, receptacle:
J603	9-84981L01	female, 5-contact
		transistor: (see note)
Q116	48-869640	NPN; type M9640
Q122	48-869887	NPN; type M9887
Q803	48-869647	PNP; type M9647
		resisitor, variable:
R46	18-83287K01	100k ± 30%; 1/4 W
R56	18-83288K01	100k ± 30%; 1/4 W (includes S601)
non-referenced items		
	1-80785B73	TRIPLER ASSEMBLY: includes
	14-861196	INSULATOR, transistor
	26-84411K01	HEAT SINK
		TRANSISTOR Q122
	1-80794B88	CAPACITOR ASSEMBLY, (C629 thru C633) feed thru includes:
	7-83134K01	BRACKET, mounting
	27-82018M03	CHASSIS
	41-83002M01	SPRING (2)
	2-10054A74	NUT, spring: 6-32
	1-80726D07	RECEPTACLE, mic assembly includes: ref. J603
	3-140211	SCREW, tapping: 6-32 x 1/4"
	3-140212	SCREW, tapping: 6-32 x 5/16"; 5 used
	3-134212	SCREW, tapping: 4-40 x 5/16"; 2 used
	3-135506	SCREW, tapping: 6-32 x 1/4"; 2 used
	3-138028	SCREW, tapping: 2-56 x 5/32"; 4 used
	14-83572K01	INSULATOR, transistor: .300 x .500" (Q116)
	14-84268A01	INSULATOR, transistor: .520 x .660" (Q803)
	14-84849K01	INSULATOR, coaxial cap: 2 used
	15-84403K01	COVER, coaxial: 2 used
	15-84410K01	COVER, mixer
	22-10133A19	PIN: .250 x .125"; 2 used
	26-82571L01	HEAT SINK
	26-83294K01	SHIELD: .990 x 1.930"
	26-83336L01	SHIELD, receiver
	26-84604K02	SHIELD, power amplifier
	26-84848K01	SHIELD, tripler: 1.750 x .205"
	29-5360	LUG, soldering: #6
	42-10217A02	STRAP, cable harness
	4-10057A18	WASHER, shoulder (Q803)
	4-84180C01	WASHER, shoulder
	3-83001M04	SCREW, tapping; 4 used
	3-83001M05	SCREW, tapping; 2 used

UNIFIED CHASSIS

EXCITER SECTION
ONE AND TWO-FREQUENCY MODELS

FUNCTION

Amplifies voice signals from the microphone and produces a low-level FM modulated rf signal for the rf power amplifier.



EXCITER/POWER AMPLIFIER, HARMONIC FILTER & ANTENNA SWITCH

UNIFIED CHASSIS

RADIO SET PARTS LIST

(Cont'd)

PARTS LIST

REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION

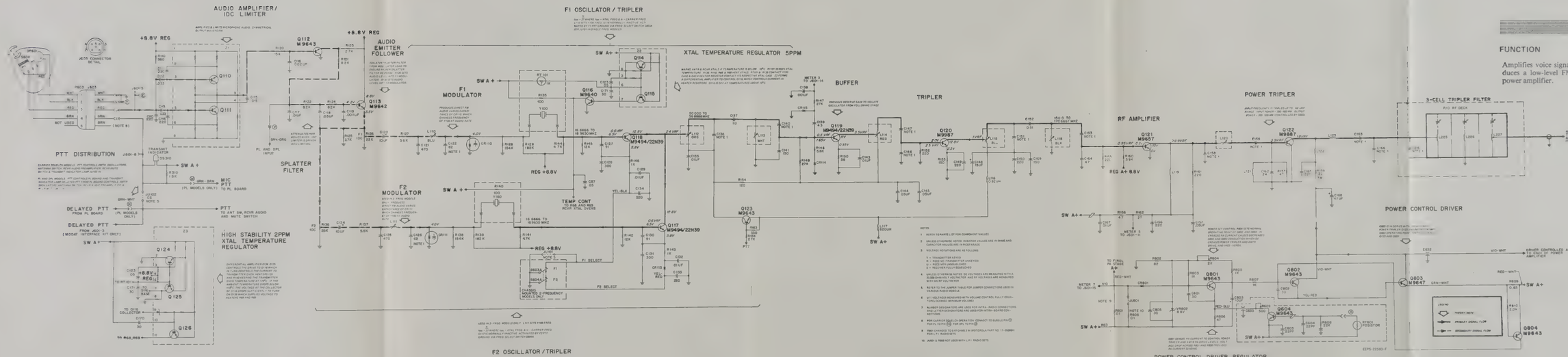
[illegible] Main Board, 1-Fre [illegible] MHz
[illegible] Main Board, 2-Low freq. (450-470 MHz)
[illegible] Main Board, 2-High freq. (470-494 MHz)
[illegible] Main Board, 2-Low freq. (494-512 MHz)
[illegible] Main Board, 2-High freq. (494-512 MHz)

NOTE: This parts list covers [illegible] models of the Main Board. Where differences exist, a letter code is added to the reference symbol to indicate the frequency range of the applicable unit. A notation in the Description column indicates when the unit is a 2- and or 4-frequency mod[illegible]

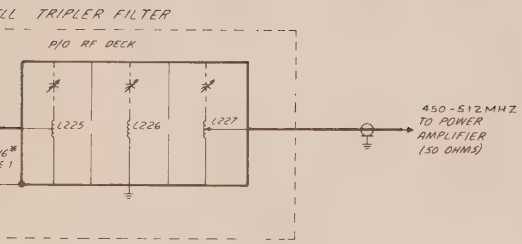
C [illegible]	21-8242-B47	CAPACITOR, fixed: [illegible] 400 V [illegible] .0047 uF, 200 V (2- and 4-Freq. [illegible] .0047 uF, 200 V (2- and 4-Freq.
C [illegible]	21-8242-B25	.0047 uF, 200 V (2- and 4-Freq.
C [illegible]	21-8239-B5	[illegible]
C [illegible]	21-8242-B43	[illegible]
C [illegible]	21-8242-B4	[illegible]
C [illegible]	21-8242-B5	[illegible]
C [illegible]	21-8242-B41	[illegible]
C [illegible]	21-8242-B2	[illegible]
C [illegible]	21-8242-B4

FUNCTION

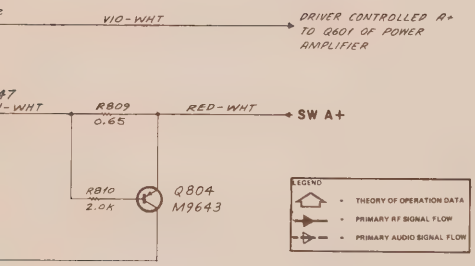
Amplifies voice signals from the microphone and produces a low-level FM modulated rf signal for the rf power amplifier.



EXCITER/POWER AMPLIFIER, HARMONIC FILTER & ANTENNA SWITCH


L TRIPLER FILTER
P/O RF DECK
L225
L226
L227
450-512MHZ
TO POWER
AMPLIFIER
(50 OHMS)

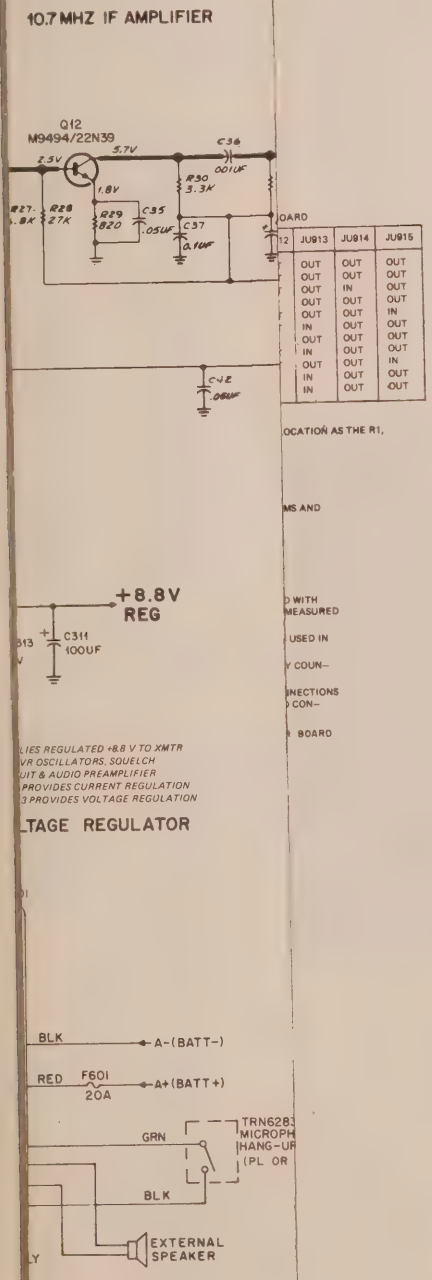
RIVER


V10-WHT
DRIVER CONTROLLED A+
TO Q601 OF POWER
AMPLIFIER
RED-WHT
SW A+
RB09
0.65
RB10
2.0K
Q804
M9643
LEGEND
THEORY OF OPERATION DATA
PRIMARY RF SIGNAL FLOW
PRIMARY AUDIO SIGNAL FLOW

8312-C

UNIFIED CHASSIS

RECEIVER SECTION
FOUR-FREQUENCY MODELS



FUNCTION

Amplifies, mixes, filters, and demodulates received rf energy from antenna (via antenna switch) and provides an amplified audio signal to the speaker.

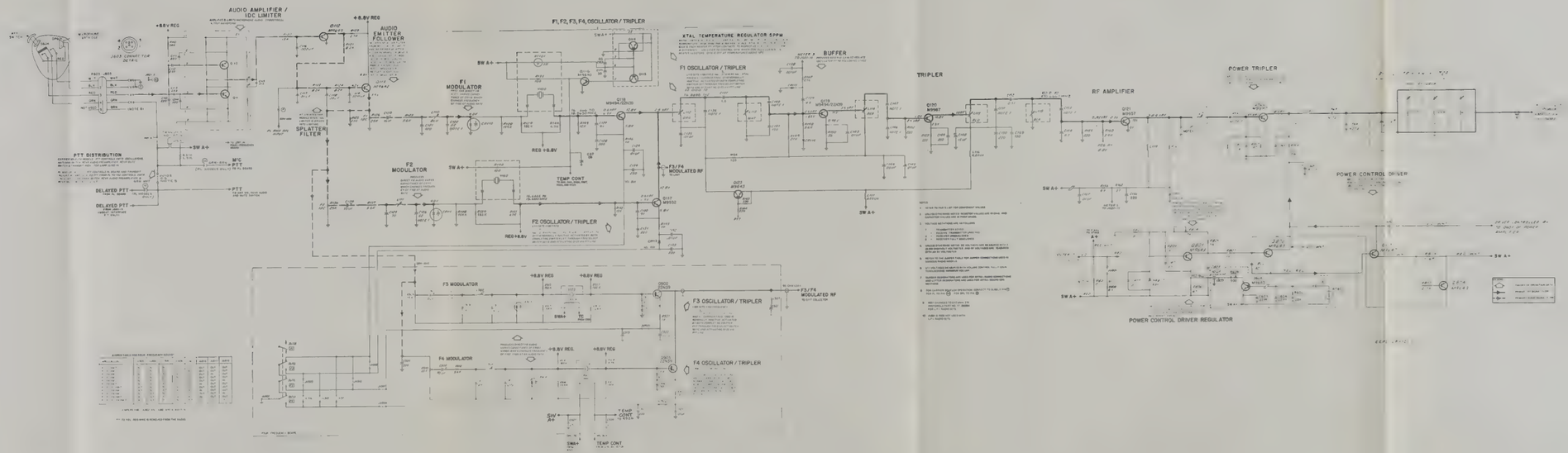
FOUR–FREQ. RECEIVER

UNIFIED CHASSIS

EXCITER SECTION
FOUR-FREQUENCY MODELS

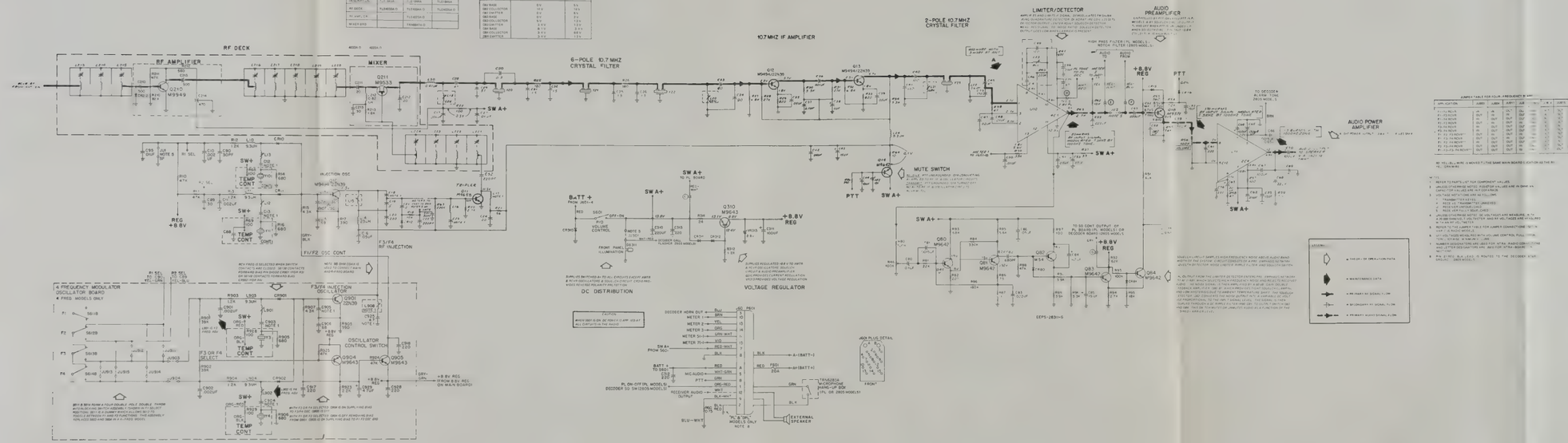
FUNCTION

Amplifies voice signals from the microphone and produces a low-level FM modulated rf sinal for the rf power amplifier.



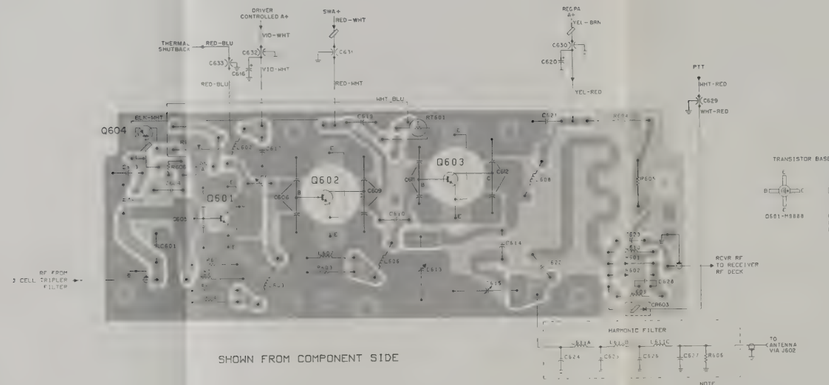
FUNCTION

Amplifies, mixes, filters, and demodulates received rf energy from antenna (via antenna switch) and provides an amplified audio signal to the speaker.



30/25 WATT RF POWER AMPLIFIER HARMONIC FILTER, AND ANTENNA SWITCH

MODELS TLE1833A (450-470 MHz — 30 WATTS)
TLE1834A (470-494 MHz — 25 WATTS)
TLE1835A (494-512 MHz — 25 WATTS)



30/25 WATT RF POWER AMPLIFIER HARMONIC FILTER, AND ANTENNA SWITCH

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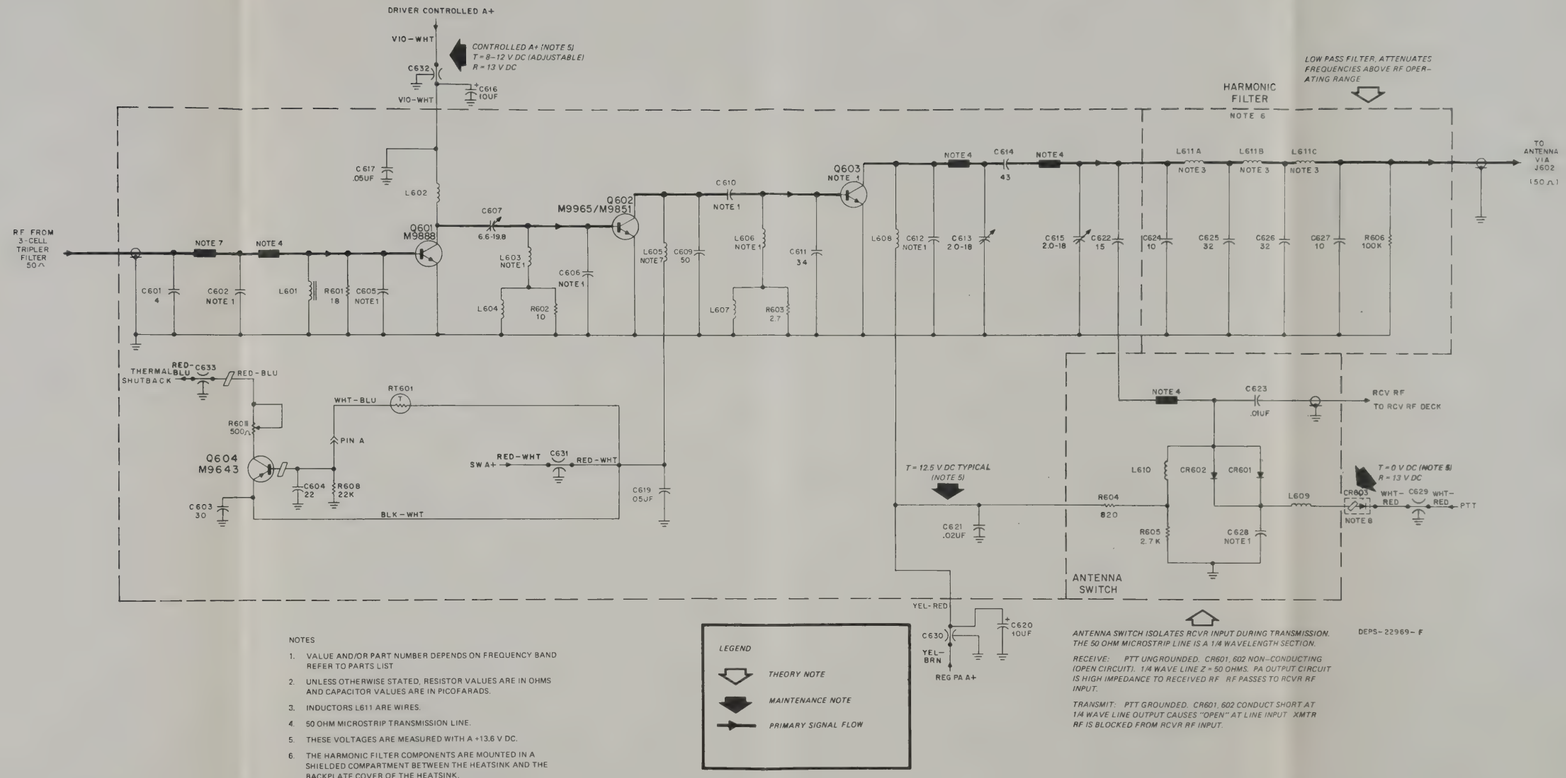


NOTES

1. VALUE AND/OR PART NUMBER DEPENDS ON FREQUENCY BAND REFER TO PARTS LIST
2. UNLESS OTHERWISE STATED, RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES ARE IN PICOFARADS.
3. INDUCTORS L611 ARE WIRES.
4. 50 OHM MICROSTRIP TRANSMISSION LINE.
5. THESE VOLTAGES ARE MEASURED WITH A +13.6 V DC.
6. THE HARMONIC FILTER COMPONENTS ARE MOUNTED IN A SHIELDED COMPARTMENT BETWEEN THE HEATSINK AND THE BACKPLATE COVER OF THE HEATSINK.
7. DISTRIBUTED ELEMENT, PART OF CIRCUIT BOARD PLATING.
8. ANODE OF CR603 SOLDERED TO BOARD.
9. FEEDTHRU CAPACITORS C629 THRU C633 P/O UNIFIED BOARD HARDWARE KIT

LEGEND

- THEORY NOTE
- MAINTENANCE NOTE
- PRIMARY SIGNAL FLOW

ANTENNA SWITCH ISOLATES RCVR INPUT DURING TRANSMISSION. THE 50 OHM MICROSTRIP LINE IS A 1/4 WAVELENGTH SECTION.

RECEIVE: PTT UNGROUNDED. CR601, 602 NON-CONDUCTING (OPEN CIRCUIT). 1/4 WAVE LINE Z = 50 OHMS. PA OUTPUT CIRCUIT IS HIGH IMPEDANCE TO RECEIVED RF. RF PASSES TO RCVR RF INPUT.

TRANSMIT: PTT GROUNDED. CR601, 602 CONDUCT SHORT AT 1/4 WAVE LINE OUTPUT CAUSES "OPEN" AT LINE INPUT. XMTR RF IS BLOCKED FROM RCVR RF INPUT.

DEPS-22969-F

FUNCTION

Provides a filtered frequency-modulated rf signal to the antenna the antenna switch switches the antenna between the transmitter and the receiver.

MOTOROLA PART NO	DESCRIPTION
ardware Kit	PL-5756-A
	CAPACITOR, fixed: pF; 1700 V unless otherwise stated
-82112K03	44 ±5%; 850 V
-83366K06	10 ±0.25 pF
-83366K07	32 ±5%
-83366K06	10 ±0.25 pF
-84494B38	15 ±5%; 500 V
-861219	1000 pF +100-0%; 500 V (p/o TRN6846A)
	CONNECTOR, receptacle:
82442E06	coaxial, chassis mounted
	COIL:
-10151A17	wire #8 gauge
-84438K01	fixed wire loop
	TRANSISTOR: (SEE NOTE)
-869888	NPN; type M9888
	RESISTOR, fixed:
125C97	100k ±10%; 1/2 W
MECHANICAL PARTS	
80785B64	HARMONIC FILTER includes: Ref. items C624 thru C627, L608, R605
-84437K01	PLATE, filter
7003	NUT, hex; 8-32 x 5/16 x 1/8"
140211	SCREW, tapping; 6-32 x 1/4"; 2 used
140212	SCREW, tapping; 6-32 x 5/16; 6 used
134212	SCREW, tapping; 4-40 x 5/16"; 2 used
136138	SCREW, tapping; 6-32 x 3/8"
139575	SCREW, machine; 6-32 x 1-1/8"
-84439K01	INSULATOR (1.07 x 1.82")
-84440K01	INSULATOR (2.19 x 1.82")
-82321L01	HEAT SINK
-5370	LUG, solder
-10128A10	RING, retainer
-82143C03	CLIP, cable
-84069B01	FERRITE BEAD; 2 used

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
TLE8953A Power Amplifier Board (2 W)		PL-5757-O
		CAPACITOR, fixed: pF ±5%; 500 V; unless otherwise stated
C601	21-83406D54	4 ±0.25 pF
C602	21-83406D90	11
C603	21-83406D97	15
C604	21-83406D93	16
C607	21-838284	3.9 ±.25 pF
C608	21-82428B06	.01 +70-30%; 100 V
C609	21-847874	12
C610	21-122235	18
C611	21-840848	6 ±.5%
C612	20-83201B11	var. 1.8-20; 400 V
C613	21-84494B11	200
C614	20-83201B11	var. 1.8-20; 400 V
C615	21-84494B38	15
C616	21-82428B06	.01 +70-30%; 100 V
C617	23-83397D01	3.3 ±20%; 25 V
C618	21-82358G78	14.3 ±2%; 25 V
C619	21-82428B06	.01 +70-30%; 100 V
		DIODE: (SEE NOTE)
CR1	48-83579K01	silicon
		COIL:
L601	24-83961B01	3-turns; coded brown
L603	24-83884G03	1-1/2 turns; coded brown
L604	24-83884G06	rf
L605	30-10286A72	wire #24 gauge solid insulation 1"
L606, 607	24-82723H01	1.2 uH
		RESISTOR, fixed: ±10%; 1/4 W; unless otherwise stated
R601	6-124A07	18 ±5%
R602	6-124D55	2.7
R603	6-125C47	820; 1/2 W
R604	6-124C59	2.7k

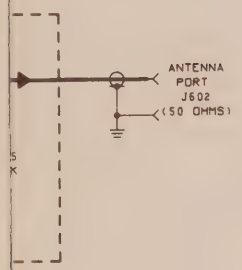
NOTE: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part number.

2/3 WATT POWER AMPLIFIER

MODEL TLE1813A

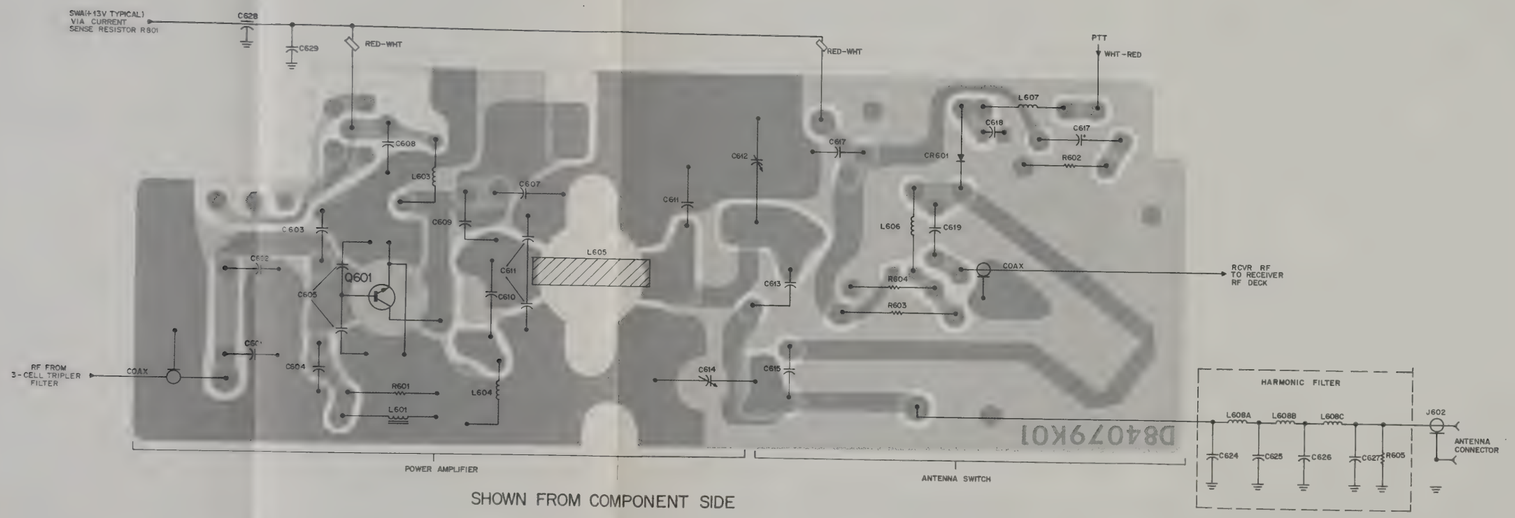
FUNCTION

Provides a filtered 2 watt frequency-modulated rf signal to the antenna; the antenna switch switches the antenna between the transmitter and the receiver. Option available for 3-watt output (this option requires only a change in the alignment procedure—no parts are changed).



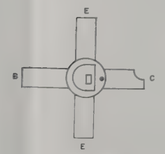
2/3 WATT POWER AMPLIFIER

MODEL TLE1813A



SHOWN FROM COMPONENT SIDE

TRANSISTOR BASE DETAILS



Q601-M9888

SOLDER SIDE ⊕ BD-DEPS-22125-O
COMPONENT SIDE © BD-DEPS-22124-O
OL-DEPS-25277-O

NOTE:
THE HARMONIC FILTER COMPONENTS ARE LOCATED BELOW THE PA BOARD WITHIN THE PA HOUSING.

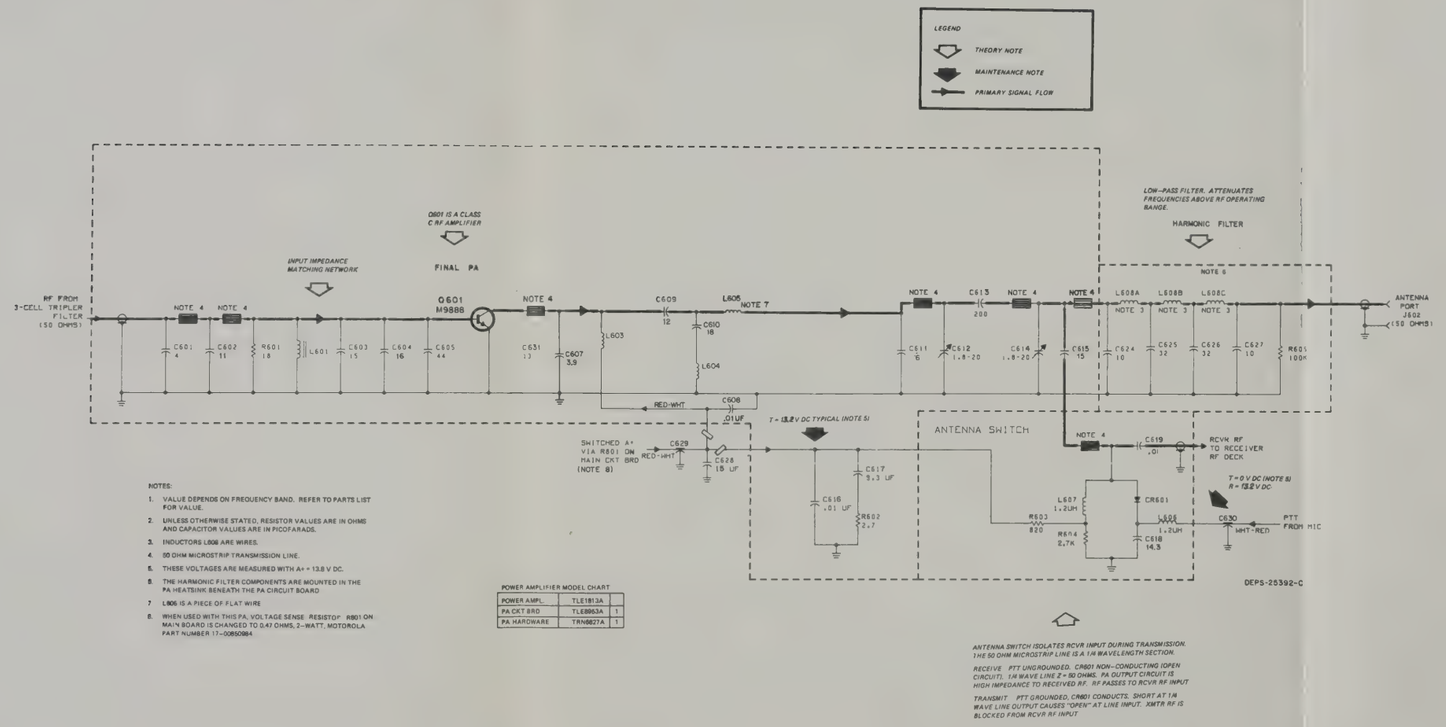
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
TRN6827A PA Hardware Kit		**PL-5756-A**
C605	21-82112K03	CAPACITOR, fixed: pF; 1700 V unless otherwise stated
C624	21-83366K06	44 ±5%; 850 V
C625, 626	21-83366K07	10 ±0.25 pF
C627	21-83366K06	32 ±5%
C628	21-84494B38	10 ±0.25 pF
C629, 630	21-861219	15 ±5%; 500 V
		1000 pF +100-0%; 500 V (p/o TRN6846A)
J602	9-82442E06	CONNECTOR, receptacle: coaxial, chassis mounted
L605	30-10151A17	COIL: wire #8 gauge
L608	42-84438K01	fixed wire loop
Q601	48-869888	TRANSISTOR: (SEE NOTE) NPN; type M9888
R605	6-125C97	RESISTOR, fixed: 100k ±10%; 1/2 W
MECHANICAL PARTS		
	1-80785B64	HARMONIC FILTER includes: Ref. items C624 thru C627, L608, R605
	64-84437K01	PLATE, filter
	2-7003	NUT, hex; 8-32 x 5/16 x 1/8"
	3-140211	SCREW, tapping; 6-32 x 1/4"; 2 used
	3-140212	SCREW, tapping; 6-32 x 5/16; 6 used
	3-134212	SCREW, tapping; 4-40 x 5/16"; 2 used
	3-136138	SCREW, tapping; 6-32 x 3/8"
	3-139575	SCREW, machine; 6-32 x 1-1/8"
	14-84439K01	INSULATOR (1.07 x 1.82")
	14-84440K01	INSULATOR (2.19 x 1.82")
	26-82321L01	HEAT SINK
	29-5370	LUG, solder
	42-10128A10	RING, retainer
	42-82143C03	CLIP, cable
	76-84069B01	FERRITE BEAD; 2 used

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
TLE8953A Power Amplifier Board (2 W)		**PL-5757-O**
C601	21-83406D54	CAPACITOR, fixed: pF ±5%; 500 V; unless otherwise stated 4 ±0.25 pF
C602	21-83406D90	11
C603	21-83406D97	15
C604	21-83406D93	16
C607	21-838284	3.9 ±.25 pF
C608	21-82428B06	.01 +70-30%; 100 V
C609	21-847874	12
C610	21-122235	18
C611	21-840848	6 ±.5%
C612	20-83201B11	var. 1.8-20; 400 V
C613	21-84494B11	200
C614	20-83201B11	var. 1.8-20; 400 V
C615	21-84494B38	15
C616	21-82428B06	.01 +70-30%; 100 V
C617	23-83397D01	3.3 ±20%; 25 V
C618	21-82358G78	14.3 ±2%; 25 V
C619	21-82428B06	.01 +70-30%; 100 V
CR1	48-83579K01	DIODE: (SEE NOTE) silicon
L601	24-83961B01	COIL: 3-turns; coded brown
L603	24-83884G03	1-1/2 turns; coded brown
L604	24-83884G06	rf
L605	30-10286A72	wire #24 gauge solid insulation 1"
L606, 607	24-82723H01	1.2 uH
R601	6-124A07	RESISTOR, fixed: ±10%; 1/4 W; unless otherwise stated 18 ±5%
R602	6-124D55	2.7
R603	6-125C47	820; 1/2 W
R604	6-124C59	2.7k

NOTE: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part number.

FUNCTION

Provides a filtered 2 watt frequency-modulated rf signal to the antenna; the antenna switch switches the antenna between the transmitter and the receiver. Option available for 3-watt output (this option requires only a change in the alignment procedure—no parts are changed).


LEGEND
THEORY NOTE
MAINTENANCE NOTE
PRIMARY SIGNAL FLOW
RF FROM 3-CELL TRIPLER FILTER (50 OHMS)
INPUT IMPEDANCE MATCHING NETWORK
Q601 IS A CLASS C RF AMPLIFIER
FINAL PA
Q601 M9888
LOW-PASS FILTER. ATTENUATES FREQUENCIES ABOVE RF OPERATING RANGE.
HARMONIC FILTER
ANTENNA PORT J602 (50 OHMS)
RED-WHT
SWITCHED A+ VIA R801 ON MAIN CKT BRD (NOTE 8)
T = 13.2 V DC TYPICAL (NOTE 5)
ANTENNA SWITCH
RCVR RF TO RECEIVER RF DECK
T = 0 V DC (NOTE 5) R = 13.2 V DC
PTT FROM MIC
WHT-RED
DEPS-25392-C
NOTES:
1. VALUE DEPENDS ON FREQUENCY BAND. REFER TO PARTS LIST FOR VALUE.
2. UNLESS OTHERWISE STATED, RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES ARE IN PICOFARADS.
3. INDUCTORS L606 ARE WIRES.
4. 50 OHM MICROSTRIP TRANSMISSION LINE.
5. THESE VOLTAGES ARE MEASURED WITH A+ = 13.8 V DC.
6. THE HARMONIC FILTER COMPONENTS ARE MOUNTED IN THE PA HEATSINK BENEATH THE PA CIRCUIT BOARD.
7. L606 IS A PIECE OF FLAT WIRE
8. WHEN USED WITH THIS PA, VOLTAGE SENSE RESISTOR R801 ON MAIN BOARD IS CHANGED TO 0.47 OHMS, 2-WATT, MOTOROLA PART NUMBER 17-08150B84
POWER AMPLIFIER MODEL CHART
POWER AMPL TLE1813A
PA CKT BRD TLE8963A 1
PA HARDWARE TRN8027A 1
ANTENNA SWITCH ISOLATES RCVR INPUT DURING TRANSMISSION. THE 50 OHM MICROSTRIP LINE IS A 1/4 WAVELENGTH SECTION.
RECEIVE PTT UNGROUNDED. CR601 NON-CONDUCTING (OPEN CIRCUIT). 1/4 WAVE LINE Z = 50 OHMS. PA OUTPUT CIRCUIT IS HIGH IMPEDANCE TO RECEIVED RF. RF PASSES TO RCVR RF INPUT
TRANSMIT PTT GROUNDED, CR601 CONDUCTS. SHORT AT 1/4 WAVE LINE OUTPUT CAUSES "OPEN" AT LINE INPUT. XMTR RF IS BLOCKED FROM RCVR RF INPUT

parts list

THN6388A Housing & Hardware Kit (Carrier Squelch) "B" Model Microphones
THN6415B Housing & Hardware Kit (Carrier Squelch) "C" Model Microphones
THN6404A Housing & Hardware Kit (Private-Line) "B" Model Microphones
THN6404B Housing & Hardware Kit (Private-Line) "C" Model Microphones

PL-7493-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		switch, microphone:
S1	40-84711E02	leaf (THN6388A, THN6415B)
S2	40-84711E03	leaf (THN6404A/B)
		non-referenced items
	2-101011A89	NUT, spring: 2 used
	3-135676	SCREW, switch mtg.: 4-40 x 1/4"; 3 used
	3-138809	SCREW, baseplate: 4-40 x 5/16"; 4 used
	3-140251	SCREW, front cover: 4-20 x 3/4"; 4 used
	4-10058B10	WASHER, felt (THN6404A/B)
	15-82978M01	COVER, front
	15-82978M01	COVER, rear (THN6388A, THN6404A)
	15-82978M03	COVER, rear (THN6415B, THN6404B)
	15-84191E01	HOUSING, microphone (THN6388A, THN6404A)
	15-84191E03	HOUSING, microphone (THN6415B, THN6404B)
	22-82591C05	PIN, roll (THN6388A, THN6415B)
	38-84184E02	BUTTON, blank (THN6388A)
	38-84184E05	BUTTON, blank (THN6415B)
	38-84184E01	BUTTON, "MONITOR" (THN6404A)
	38-84184E04	BUTTON, "MONITOR" (THN6404B)
	38-84192E01	BUTTON, "TRANSMIT" (THN6388A, THN6404A)
	38-84192E03	BUTTON, "TRANSMIT" (THN6415B, THN6404B)
	42-82143C05	CLAMP, cable
	42-84725E01	CLIP, shaft retainer
	47-84193E01	SHAFT, button mtg. pivot
	47-84194E01	SHAFT, extension
	47-84723E01	SHAFT, coupling (THN6388A, THN6415B)
	54-82977M01	PLATE, base
	75-84722E01	PAD, base plate

note: "B" model microphone parts and "C" model microphone parts are not interchangeable.

TKN8094A Cable Kit, "Maxar" Paging Base Station — PL-6865-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	29-847854	LUG, slotted tongue: 5 used
	30-83560A02	CABLE, 6-conductor: 48" long
	37-82633B13	GROMMET, rubber

TKN8095A Cable Kit, "Maxar 80" Base Station — PL-6866-B

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15-82062M01	HOUSING, cable
	28-83005M01	CONNECTOR, plug: 5-contact
	30-83560A02	CABLE, 6-conductor: 60" long
	37-82633E13	GROMMET, rubber
	42-82061M01	CLAMP, cable
	43-82062M01	COLLAR
	29-83277G01	LUG, cable: 5-used

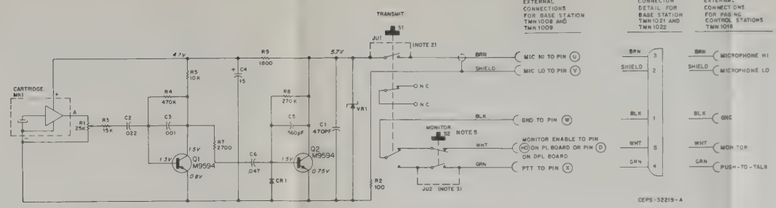
TKN8093A Cable Kit, "Maxar" Base Station — PL-6864-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	30-83560A02	CABLE, 6-conductor; 60" long
	39-10184A24	CONTACT, receptacle: 5 used
	37-82633B13	GROMMET, rubber

TRN4315A Microphone Circuit Board — PL-6863-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 500 V; unless otherwise stated
C1	21-82187B45	470 pF
C2	8-82096J08	.022; 250 V
C3	21-82187B44	.001; 100 V
C4	23-84865F09	15 + 150 -10%; 25 V
C5	21-82187B06	560 pF
C6	8-82096J04	.047; 250 V
		diode: (see note)
CR1	48-83654H01	silicon
		cartridge, microphone:
MK1	50-82825M02	electret
		transistor: (see note)
Q1, 2	48-869594	NPN; type M9594
		resistor, fixed: ± 5%; 1/4 W; unless otherwise stated
R1	18-84944C02	variable; 25k ± 20%
R2	5-11009C25	100
R3	5-11009C77	15k
R4	5-11009C14	470k
R5	5-11009C73	10k
R7	5-11009C59	2.7k
R8	5-11009D08	270k
R9	5-11009C55	1.8k
		diode: (see note)
VR1	48-82256C38	Zener; 9.1 V ± 5%

note: For optimum performance diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

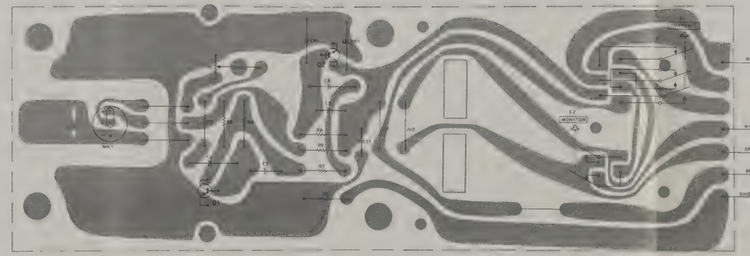


NOTES
1 UNLESS OTHERWISE STATED: ALL CAPACITOR VALUES ARE IN MICROFARADS
2 REMOVE J1/1 FOR PARALLEL OPERATION
3 REMOVE J1/2 TO MONITOR BEFORE TRANSMIT
4 ALL DC VOLTAGE READINGS ARE WITH RESPECT TO THE MIC LO LEAD
5 MONITOR SWITCH S2 IS PRESENT IN MODELS TMN1008 TMN1018, AND TMN1022 ONLY

DESK MICROPHONE MODEL COMPLEMENT

TMN1008C	TMN1009C	TMN1018C	TMN1021C	TMN1022C	DESCRIPTION
	X		X	X	TRN4315A MICROPHONE CIRCUIT BOARD
-	-	X	X	X	THN6404B MICROPHONE HOUSING AND HARDWARE KIT (PL) AND (DPL) (SEE NOTE)
	X		X		THN6415B MICROPHONE HOUSING AND HARDWARE KIT (CARRIER SQUELCH) (SEE NOTE)
X	X				TKN8093A CABLE KIT
		X			TKN8094A CABLE KIT
			X	X	TKN8095A CABLE KIT

NOTE THE TMN1008B,18B, AND 22B USE THE THN6404A HOUSING INSTEAD OF THE THN6404B THE TMN 1008B AND 21B USE THE THN6388A HOUSING INSTEAD OF THE THN6415B



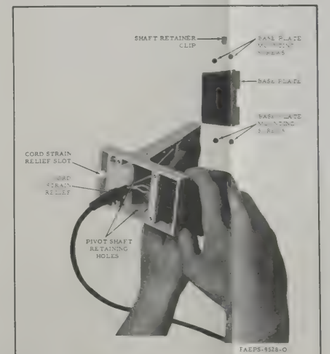


Figure 2. Microphone Assembly Detail

DESK MICROPHONES

MODELS TMN1008B/C, TMN1009B/C, TMN1018B/C, TMN1021B/C, TMN1022B/C

FUNCTION

The desk microphones provide a desk surface self-supporting stand to mount the TRANSMIT and PL MONITOR switches and to support the electret condenser microphone element at mouth level. The TMN1008B/C, and TMN1022B/C are used in *Private-Line* squelch systems and provide both TRANSMIT and MONITOR switches; the TMN1009B/C, and TMN1021B/C are used with carrier squelch systems and use only the TRANSMIT switch. The TMN1018B/C is used in paging applications and includes both TRANSMIT and MONITOR switches.

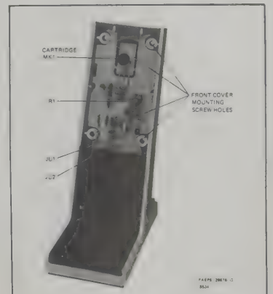
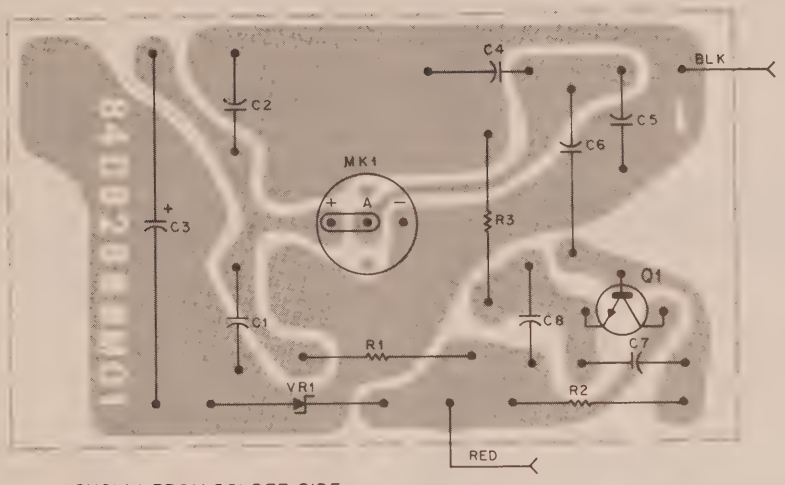


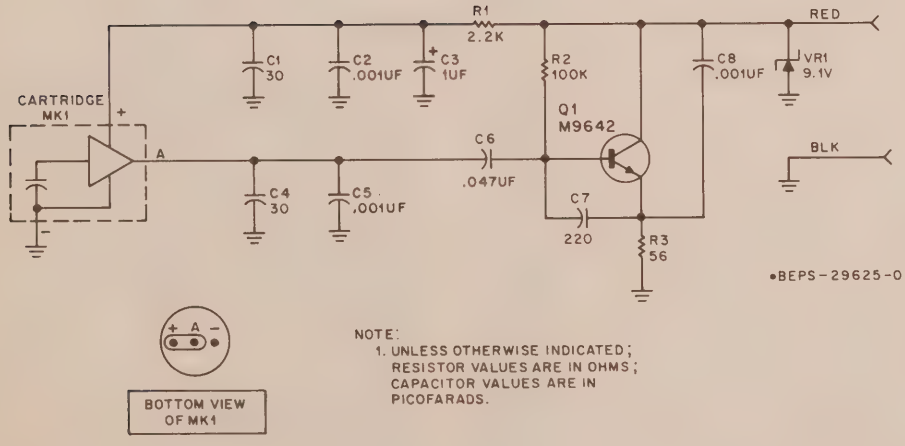
Figure 1. Microphone Detail

MICROPHONE/PREAMPLIFIER

FOR MOBILE MICROPHONE MODELS
TMN6104B AND TMN6134B



CIRCUIT BOARD DETAIL



PREAMPLIFIER SCHEMATIC DIAGRAM

PARTS LIST SHOWN ON BACK

parts list

TMN6104B & TMN6134B Microphone/Preamplifier PL-6843-L

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±20%; 600 V: unless otherwise stated:
C1	21-82610C14	30 ±5%; 200 V
C2	21-859601	1000
C3	23-84669A24	1 uF +150-10%; 25 V
C4	21-82610C14	30 ±5%; 200 V
C5	21-859601	1000
C6	8-82096J04	.047 uF ±10%; 250 V
C7	21-82187B08	220 ±10%; 500 V
C8	21-859601	1000
		preamplifier assembly:
DP601	1-80724D70	**note:** Detail parts of the preamplifier assembly are included in this parts list
		cartridge, microphone:
MK1	50-82825M02	electret-condenser
		connector, assembly (p/o W601 — TMN6134B only):
P603	—	includes:
	15-82062M02	HOUSING, connector
	28-82005M01	CONNECTOR, plug; 5-contact
	43-82063M01	COLLAR, connector
		transistor: (see note)
Q1	48-869642	NPN; M9642
		resistor, fixed: ±5%; 1/4 W: unless otherwise otherwise stated:
R1	6-11009C57	2.2k
R2	6-11009C97	100k
R3	6-11009C19	56
		switch, microphone:
S604	40-82263G02	dpst
		diode: (see note):
VR1	48-82256C38	Zener; 9.1 V ±5%
		cord assembly, microphone (TMN6104B only):
W601	1-80778B38	includes:
	29-83277G01	LUG, terminal: 8 used
	30-82565B39	CORD, coiled: 4-conductor
	39-10184A24	CONTACT, receptacle
		cord assembly, microphone (TMN6134B only):
W601	—	includes:
	1-80718D46	CONNECTOR ASSEMBLY P603
	1-80708D76	CORD SUBASSEMBLY includes:
	29-83277G01	LUG, terminal; 8 used
	30-82565B40	CORD, coiled; 4-conductor
		non-referenced items
	1-80710D23	HOUSING ASSEMBLY, rear
		includes:
	4-82705B01	WASHER, back-up: .261 x 1.120 x .050"
	4-82707B01	WASHER, flat: .265 x 1.360 x .034"
	15-82662M13	HOUSING, rear
	1-80730D80	WIRE & LUG ASSEMBLY (TMN6134B only)
		includes:
	29-83167L01	TERMINAL, strain relief
	1-80724D39	WIRE & LUG ASSEMBLY (TMN6104B only)
		includes:
	29-82713M01	TERMINAL, contact
	3-135102	SCREW, machine: 4-40 x 1/4"; 2 used
	3-139999	SCREW, tapping: 6-19 x 3/8"; 3 used
	3-140000	SCREW, tapping: 6-19 x 3/4"; 3 used
	5-10115A42	GROMMET, rubber: .406" ID
	13-84599B02	EMBLEM
	15-82662M23	HOUSING, front
	15-82896M02	HOUSING, microphone adapter
	32-82703B01	GASKET, microphone
	33-82599D05	NAMEPLATE (TMN6134B only)
	33-82599D06	NAMEPLATE (TMN6104B only)
	35-82652K01	BAFFLE, microphone
	38-84559B03	BUTTON, microphone
	37-84332M01	BOOT, radio strain relief (TMN6134B only)
	37-84333M01	BOOT, microphone strain relief
	42-852710	STRAP, mounting (TMN6134B only)
	42-83894F02	CLIP, mic cord

note: For optimum performance, replacement diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

parts l

TRN6177B/C A

REFEREN
SYMBOL

C401
C402, 403
C404
C405
C406
C407, 408
C409
C410
C411
C412
C413*, 414
C415
C416*
C417
C418, 419
C420
C421
C422
C423, 424
C425
C426
C427
C428
C429*
C430
C431
C433
C434
C435
C436
C437
C438*
C439
C440

CR401
CR402*
CR404
CR405, 407*
408, 409

L401

Q401, 402
Q403, 404*,
Q406*
Q407
Q408
Q409

R401, 402
R403, 404, 40
R406
R407
R408
R409
R410
R411
R412
R413
R414
R415*
R416
R417*
R418*
R419*
R420*
R421
R424*
R425*

R426*
R427*
R428
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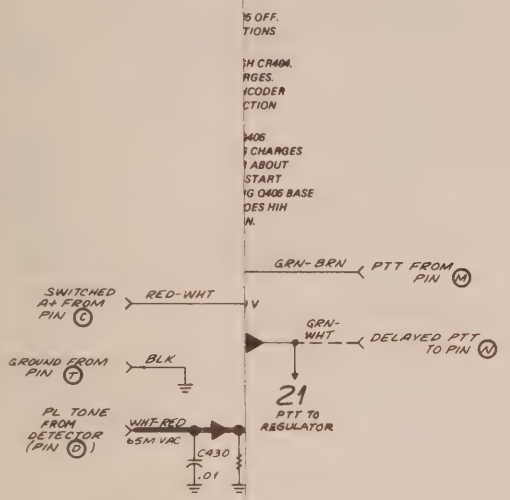
R442
R443, 444
R445
R446



= THEORY OF OPERATION

= MAINTENANCE DATA

= RECEIVE SIGNAL

= TRANSMIT SIGNAL

= PTT CONTROL SIGNAL

= SQUELCH CONTROL SIGNAL

TONE *PRIVATE-LINE* ENCODER/DECODER

MODEL TRN6177C

FUNCTION

Encodes and decodes Tone *Private-Line* codes. Encoder modulates transmitter and delays transmitter turn-off 150 milliseconds to allow transmission of turn-off reverse tone burst. *Squelch tail elimination (reverse burst) is standard with* ***Maxar*** *and* ***Maxar•80*** *radios, but is supplied with* ***Moxy*** *radios only with Option B309.* Decoder detects received tone and unsquelches receiver when proper code is received.

68P81029E99-V
1/21/83- PHI

parts list

TMN6104B & TMN6134B Microphone/Preamplifier PL-6843-L

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: pF ±20%; 600 V: unless otherwise stated:
C1	21-82610C14	30 ±5%; 200 V
C2	21-859601	1000
C3	23-84669A24	1 uF + 150-10%; 25 V
C4	21-82610C14	30 ±5%; 200 V
C5	21-859601	1000
C6	8-82096J04	.047 uF ±10%; 250 V
C7	21-82187B08	220 ±10%; 500 V
C8	21-859601	1000
		preamplifier assembly:
DP601	1-80724D70	**note:** Detail parts of the preamplifier assembly are included in this parts list
		cartridge, microphone:
MK1	50-82825M02	electret-condenser
		connector, assembly (p/o W601 — TMN6134B only):
P603	—	includes:
	15-82062M02	HOUSING, connector
	28-82005M01	CONNECTOR, plug; 5-contact
	43-82063M01	COLLAR, connector
		transistor: (see note)
Q1	48-869642	NPN; M9642
		resistor, fixed: ±5%; 1/4 W: unless otherwise otherwise stated:
R1	6-11009C57	2.2k
R2	6-11009C97	100k
R3	6-11009C19	56
		switch, microphone:
S604	40-82263G02	dpst
		diode: (see note):
VR1	48-82256C38	Zener; 9.1 V ±5%
		cord assembly, microphone (TMN6104B only):
W601	1-80778B38	includes:
	29-83277G01	LUG, terminal: 8 used
	30-82565B39	CORD, coiled: 4-conductor
	39-10184A24	CONTACT, receptacle
		cord assembly, microphone (TMN6134B only):
W601	—	includes:
	1-80718D46	CONNECTOR ASSEMBLY P603
	1-80708D76	CORD SUBASSEMBLY includes:
	29-83277G01	LUG, terminal; 8 used
	30-82565B40	CORD, coiled; 4-conductor
		non-referenced items
	1-80710D23	HOUSING ASSEMBLY, rear includes:
	4-82705B01	WASHER, back-up: .261 x 1.120 x .050"
	4-82707B01	WASHER, flat: .265 x 1.360 x .034"
	15-82662M13	HOUSING, rear
	1-80730D80	WIRE & LUG ASSEMBLY (TMN6134B only) includes:
	29-83167L01	TERMINAL, strain relief
	1-80724D39	WIRE & LUG ASSEMBLY (TMN6104B only) includes:
	29-82713M01	TERMINAL, contact
	3-135102	SCREW, machine: 4-40 x 1/4"; 2 used
	3-139999	SCREW, tapping: 6-19 x 3/8"; 3 used
	3-140000	SCREW, tapping: 6-19 x 3/4"; 3 used
	5-10115A42	GROMMET, rubber: .406" ID
	13-84599B02	EMBLEM
	15-82662M23	HOUSING, front
	15-82896M02	HOUSING, microphone adapter
	32-82703B01	GASKET, microphone
	33-82599D05	NAMEPLATE (TMN6134B only)
	33-82599D06	NAMEPLATE (TMN6104B only)
	35-82652K01	BAFFLE, microphone
	38-84559B03	BUTTON, microphone
	37-84332M01	BOOT, radio strain relief (TMN6134B only)
	37-84333M01	BOOT, microphone strain relief
	42-852710	STRAP, mounting (TMN6134B only)
	42-83894F02	CLIP, mic cord

note: For optimum performance, replacement diodes, transistors and integrated circuits must be ordered by Motorola part numbers.

parts list

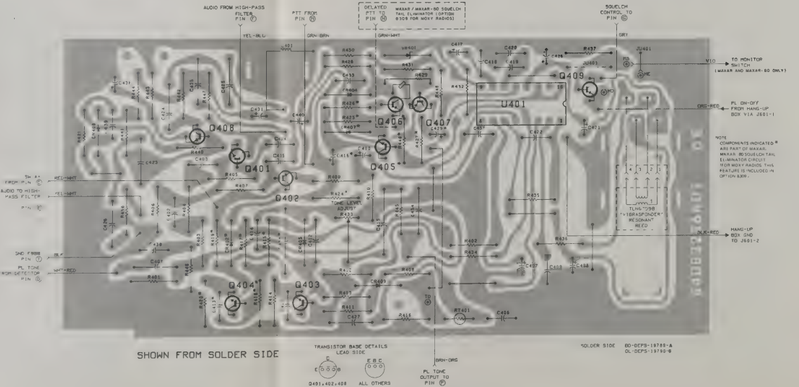
TRN6177B/C *Private-Line* Encoder/Decoder — PL-3340-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed; uF ± 10%; 100 V: unless otherwise stated
C401	8-82096J18	0.1 ± 10%; 250 V
C402, 403	21-83596E09	.01 + 80-20%; 200 V
C404	21-82428B23	.0012
C405	21-83596E08	.01 + 80-20%; 200 V
C406	21-83596E10	220 pF ± 20%; 500 V
C407, 408	23-84665F01	10 + 100-0%; 25 V
C409	21-83596E23	.0047; 200 V
C410	23-84665F01	10 + 100-0%; 25 V
C411	21-83596E10	220 pF ± 20%; 500 V
C412	8-82096J18	0.1 ± 10%; 250 V
C413*, 414	21-83596E10	220 pF ± 20%; 500 V
C415	8-82096J20	0.22; 250 V
C416*	23-84665F01	10 + 100-0%; 25 V
C417	23-84665F20	1 + 20%; 50 V
C418, 419	21-83596E23	.0047; 200 V
C420	21-83596E10	220 pF ± 20%; 500 V
C421	23-84665F01	10 + 100-0%; 25 V
C422	21-83596E10	220 pF ± 20%; 500 V
C423, 424	23-84696D04	.047 ± 20%, 100 V
C425	8-82096J07	0.15; 50 V
C426	23-84696D04	.047 ± 20%, 100 V
C427	8-82096J18	0.1 ± 10%; 250 V
C428	23-84665F01	10 + 100-0%; 25 V
C429*	23-84665F20	1 + 20%; 50 V
C430	21-83596E09	.01 + 80-20%; 200 V
C431	23-84665F20	1 + 20%; 50 V
C433	23-84696E10	220 pF ± 20%; 500 V
C434	8-84633J06	.0068 ± 5%; 630 V
C435	23-84696D04	.047 ± 20%, 100 V
C436	23-84665F01	10 + 100-0%; 25 V
C437	21-83596E10	220 pF ± 20%; 500 V
C438*	8-82096J20	0.22; 250 V
C439	21-82428B28	.002
C440	23-84665F20	1.0 ± 20%; 50 V
		diode (see note)
CR401		NOT USED
CR402*	48-83654H01	silicon
CR404	48-82178A06	germanium
CR405, 407*, 408, 409	48-83654H01	silicon
L401	25-82498H02	coil; 6 H
		transistor (see note)
Q401, 402	48-134867	NPN; type M54
Q403, 404*, 405	48-869642	NPN; type M9642
Q406*	48-869528	NPN; type M9528
Q407	48-869643	PNP; type M9643
Q408	48-134867	NPN; type M54
Q409	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W unless otherwise stated
R401, 402	6-11009D02	150k
R403, 404, 405	6-11009C99	120k
R406	6-11009D02	150k
R407	6-11009C95	120k
R408	6-11009C49	*
R409	6-11009C88	6.8k
R410	6-11009C63	3.3k
R411	6-11009D02	150k
R412	6-11009C85	33k
R413	6-11009C55	1.8k
R414	6-11009C37	330
R415*	6-11009D13	68k
R416	6-11009C65	4.7k
R417*	6-11009C69	5.6k
R418*	6-11009C85	33k
R419*	6-11009C55	1.8k
R420*	6-11009C31	330
R421*	6-11009C67	22k
R424*	6-11009C67	16k
R425*	6-11009C73	10k (TRN6177C)
	6-11009C89	27k (TRN6177B)
R426*	6-11009C73	10k
R427*	6-11009C79	18k
R428	6-11009C49	1k
R429	6-11009C83	27k
R430	6-11009C33	22C
R431	6-11009C81	3.3k
R432	6-11009C57	2.2k
R433	18-84644C02	variable; 25k
R434	6-11009C53	1.5k
R436	6-11009C45	68C
R437	6-11009C87	100k
R438	6-11009C73	10k
R440	6-11009D02	150k
R441	6-11009C89	47k
R442	6-11009C97	100k
R443, 444	6-11009C73	10k
R445	6-11009C77	15k
R446	6-11009C85	33k

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R447	6-11009C48	1k
R448	6-11009C97	100k
R449*	6-11009C73	10k
R450	6-11009A81	3.3k (TRN6177C only)
		thermistor:
RT401	5-82990E18	190 ohms
		integrated circuit: (see note)
U401	51-80074C02	type 74C02
		diode: (see note)
VR401	48-82256C25	Zener type; 12 V
		non-referenced items
	42-84116B02	SOCKET, *Vibrasponder*
	39-10184A10	CONTACT, push-pin; male
	39-10184A24	CONTACT, push-pin; female; 9 req'd
	29-84706E06	PIN, female

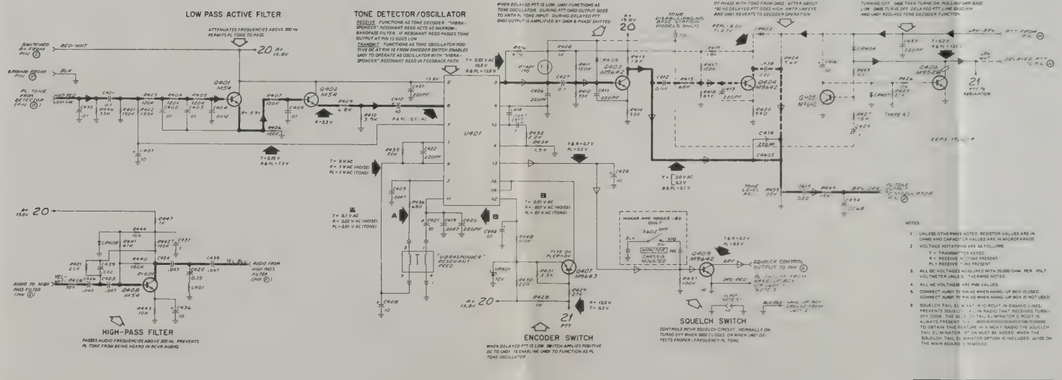
note: For optimum performance, replacement diodes, transistors, and integrated circuits must be ordered by Motorola part numbers

* Components are part of Squelch Tail Eliminator Option 309 for *Moxy* radios



TONE *PRIVATE-LINE* ENCODER/DECODER

MODEL TRN6177C



FUNCTION

Encodes and decodes Tone *Private-Line* codes. Encoder modulates transmitter and delays transmitter turn-off 150 milliseconds to allow transmission of turn-off reverse tone burst. *Squelch tail elimination (reverse burst) is standard with Maxar and Maxar•80 radios, but is supplied with Moxy radios only with Option B309.* Decoder detects received tone and unsquelches receiver when proper code is received.

68P81029E99-V
1/21/83- PHI

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		network:
Z301	51-82142K02	resistive
		crystal: (see note 2)
Y301	48-82656M03	resonator; 50.00000 kHz
		voltage regulator:
VR301	48-82256C34	Zener type; 11.0 V
VR302	48-83696E07	Zener type; 6.2 V
		mechanical parts
	26-84271B03	SHIELD, transistor
	42-10217A02	STRAP, tie, 3 used
	39-10184A24	CONTACT, receptacle; 17 used
	29-84706E06	TERMINAL, crimp socket; 2 used

notes:

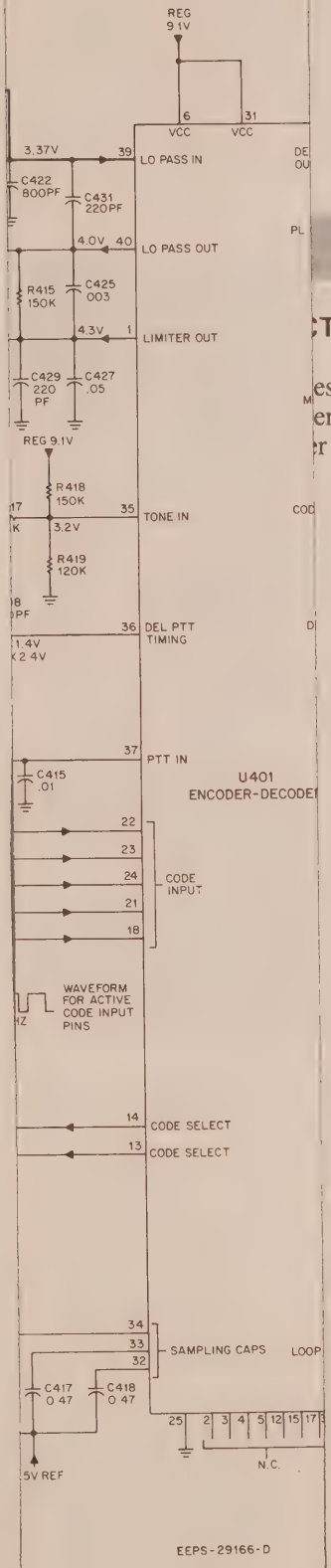
1. Replacement transistors must be ordered by Motorola part number only for optimum performance.

2. When ordering crystal units, specify carrier frequency, crystal frequency and crystal type number.

* Components are part of Squelch Tail Eliminator Option 309 for *Moxy* radios.

...SS TONE *PRIVATE-LINE*
...CH ENCODER/DECODER

MODEL TRN4237A



...CTION

...es and decodes sub-audible *Private-Line* tones. ...er modulates transmitter. Decoder unsquelches ...r when proper incoming tone is detected.

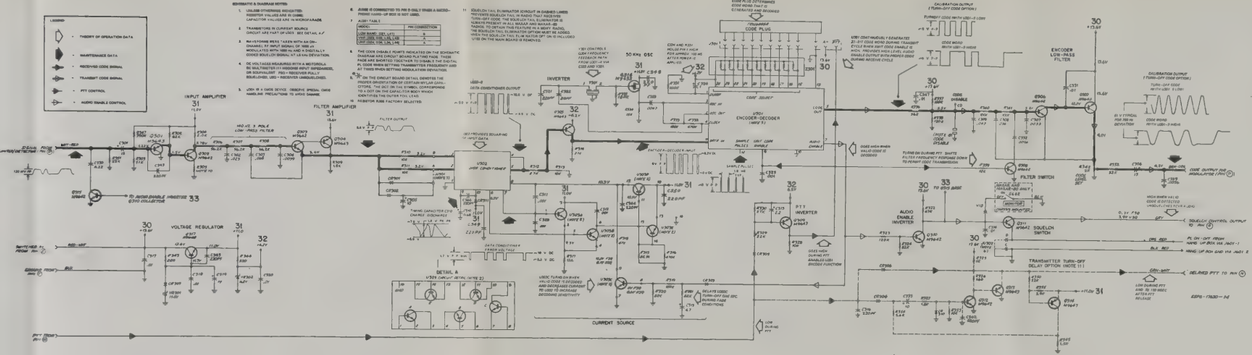
REEDLESS TONE *PRIVATE-LINE* ENCODER/DECODER

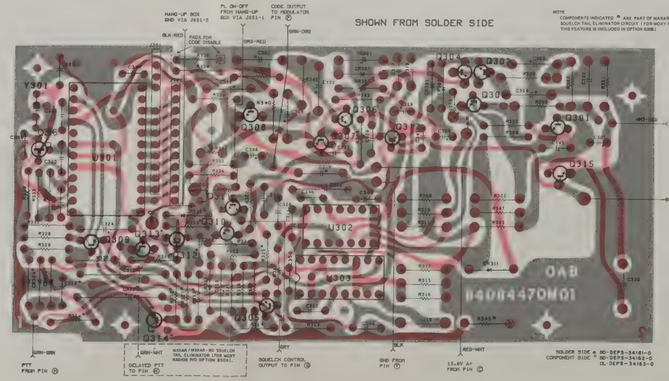
Motorola No. PEPS-31303-C
(Sheet 1 of 2)
11/15/82-PHI

DIGITAL PRIVATE-LINE
ENCODER/DECODER
MODEL TRN6207A

FUNCTION

Encodes and decodes *Digital Private-Line* codes. Encoder modulates transmitter and delays transmitter turn-off 150 milliseconds to allow transmission of turn-off code burst. *Squelch tail elimination (turn-off code)* is standard with *Maxar* and *Maxar*•*80* radios, but is supplied with *Moxy* radios only with Option B309. Decoder detects received code and unsquelches receiver when proper code is received.





parts list

TRN6207A *Digital Private-Line* Encoder-Decoder FL-3560-L

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitors, fixed: uF ± 5%; 50 V; unless otherwise stated
C301, 306, 319	23-84665F02	15 ± 100-0% 35 V
C302	8-8090SG39	.023
C303	8-83813H23	.068
C304	8-83813H19	.0039
C305	23-84665F01	10 ± 100-0% 35 V
C307	8-83813H27	.0033
C308	8-83813H24	.036
C309	8-83813H14	.043
C310	23-82783B48	0.68, 35 V
C311, 312, 328	21-82187B44	.001 ± 10%, 100 V
C313	23-84782H07	4.7 ± 30%, 10 V
C314, 317, 318, 320, 331	21-83596E37	.01 + 70-30%, 200 V
C315	23-82783B18	2.2 ± 10%, 25 V
C316*, 344, 345	21-83596E10	220 pF ± 10%, 500 V
C321	21-83596E10	220 pF ± 10%, 500 V
C322	21-84493B21	30 pF, 500 V
C323	21-82428B09	.0047 ± 10%, 100 V
C324	23-82783B08	1 ± 20%, 35 V
C325	21-82187B44	.001 ± 10%, 100 V
C329, 332	8-83813H26	.0056
C330	8-8090SG32	0.22 ± 10%
C333*	23-82783B27	10
C342*	21-83596E17	680 pF ± 10%, 500 V
C343, 346	21-82240K21	220 pF
C347	21-82213E12	.01 + 20%, 100 V
C348, 349, 350	21-83596E10	220 pF ± 10%, 500 V
		diode: (see note 1)
CR301, 302	48-84616A11	hot carrier
CR303, 304*, 305, 307, 310*, 311	48-83854H01	silicon
CR306*	48-82178A06	germanium
		socket:
J301	9-80071K01	female; 12 contact
		transistor: (see note 1)
C301, 304, 305, 307, 309, 313*, 314*	48-869643	PNP; type M9643
Q302, 303, 306, 308, 310, 311, 312*, 315	48-869642	NPN; type M9642
Q316	48-869653	field-effect; type M9653
Q317	48-868648	NPN; type M9648
		resistor, fixed: ± 5%; 1/4 W; unless otherwise stated
R302	6-11009C35	82k
R303	6-11009C30	51k
R304	6-11009C56	2.0k
R306		(factory selected)
R306, 327, 308	6-13755D64	56.2k ± 1%
R309, 327*	6-11009C05	1.8k
R310, 311	6-11009C73	10k
R312	6-11009C09	2.7k
R313, 328, 353*	6-11009C73	10k
R314	6-11009C83	27k
R315	6-13755D80	82.5k
R316, 332	6-11009D14	470k
R317, 339	6-11009C75	12k
R318	6-11009C89	47k
R319, 323, 338	6-11009C99	120k
R320, 321, 324	6-11009C95	82k
R322	6-11009CB9	47k
R325*	6-11009C49	1k
R326*	6-11009C43	560
R329	6-11009C81	22k
R330	6-11009C83	27k
R331	6-11009C97	100k
R333	6-11009D04	180k
R334	6-11009C77	15k
R335	6-11009D04	180k
R336	6-11009C91	56k
R337, 340, 341	6-11009C97	100k
R342	18-84944C01	var; 2k
R343	6-11009C33	220
R344	6-11009C37	330
R345*	6-11009C53	1.5k
R347	6-11009C12	390k
R350*, 351, 352	6-11009C61	22k
R354*	6-11009C67	5.6k
R355*	6-11009C63	3.9k
		integrated circuit: (see note 1)
U301	51-80074C01	encoder-decoder
U302	51-83629A01	data conditioner
U303	51-83629A10	current source

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		network:
Z301	51-82142K02	resistive
		crystal: (see note 2)
Y301	48-82666M03	resonator; 50.00000 kHz
		voltage regulator:
VR301	48-82256C34	Zener type; 11.0 V
VR302	48-83696E07	Zener type; 6.2 V
		mechanical parts
	28-84271B03	SHIELD, transistor
	42-10217A02	STRAP, tie; 3 used
	39-10184A24	CONTACT, receptacle; 17 used
	29-84706E06	TERMINAL, crimp socket; 2 used

notes:

1. Replacement transistors must be ordered by Motorola part number only for optimum performance
2. When ordering crystal units, specify carrier frequency, crystal frequency and crystal type number

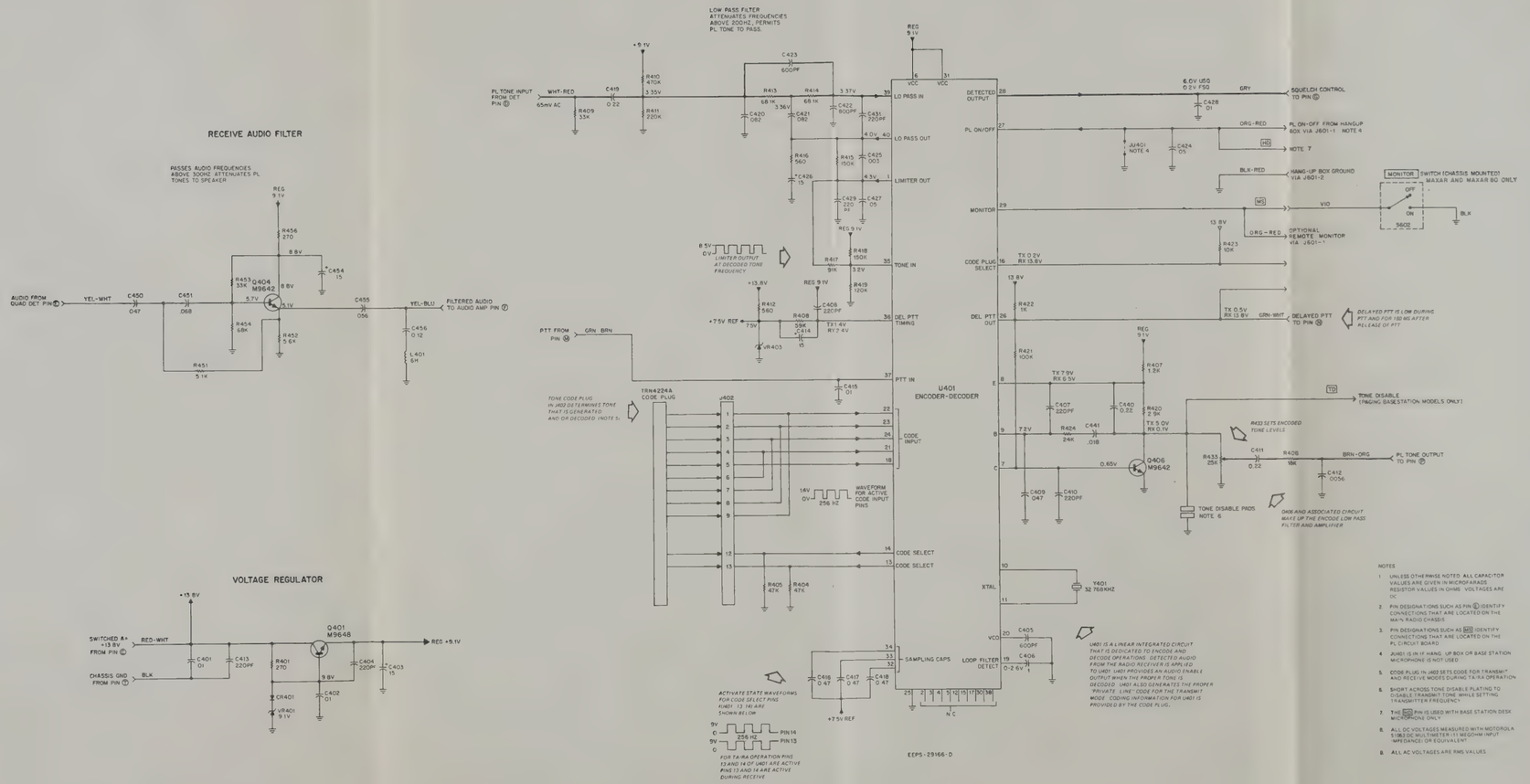
* Components are part of Squelch Tail Elimination Option 309 for Moxy radios

REEDLESS TONE *PRIVATE-LINE* SQUELCH ENCODER/DECODER

MODEL TRN4237A

FUNCTION

Encodes and decodes sub-audible *Private-Line* tones. Encoder modulates transmitter. Decoder unsquelches receiver when proper incoming tone is detected.


RECEIVE AUDIO FILTER
PASSES AUDIO FREQUENCIES ABOVE 300HZ ATTENUATES PL TONES TO SPEAKER
AUDIO FROM QUAD DET PIN 7
YEL-WHT
C450 .047
C451 .068
R451 5.1K
R453 33K
Q404 M9642
R454 68K
R452 5.6K
C454 15
C455 .056
YEL-BLU
FILTERED AUDIO TO AUDIO AMP PIN 7
C456 0.12
L401 6H
REG 9.1V
R456 270
VOLTAGE REGULATOR
+13.8V
SWITCHED B+ +13.8V FROM PIN 12
RED-WHT
CHASSIS GND FROM PIN 3
BLK
C401 .01
C413 220PF
R401 270
Q401 M9648
C404 220PF
C403 15
CR401
VR401 9.1V
C402 .01
RED +9.1V
LOW PASS FILTER ATTENUATES FREQUENCIES ABOVE 300HZ, PERMITS PL TONE TO PASS
PL TONE INPUT FROM DET PIN 8
WHT-RED
65mV AC
C419 0.22
R409 33K
R410 470K
R411 220K
C423 600PF
R413 68.1K
R414 68.1K
C420 .082
C421 .082
C422 .002PF
C431 220PF
R415 150K
C425 .003
C426 15
C429 220 PF
C427 .05
R417 91K
R418 150K
R419 100K
C408 220PF
R408 59K
C414 15
VR403
R412 560
LIMITER OUTPUT AT DECODES TONE FREQUENCY
LO PASS IN
LO PASS OUT
LIMITER OUT
TONE IN
DEL PTT TIMING
PTT IN
PTT FROM PIN 9
GRN-BRN
C415 .01
TRN4224A CODE PLUG
TONE CODE PLUG IN J402 DETERMINES TONE THAT IS GENERATED AND OR DECODED (NOTE 5)
J402
CODE INPUT
WAVEFORM FOR ACTIVE CODE INPUT PINS
256 HZ
CODE SELECT
R405 47K
R404 47K
U401 ENCODER-DECODER
SAMPLING CAPS
LOOP FILTER DETECT
VCO
XTAL
Y401 32.768KHZ
C405 600PF
C406 0-2.6V
C416 0.47
C417 0.47
C418 0.47
ACTIVATE STATE WAVEFORMS FOR CODE SELECT PINS U401. 13 14 ARE SHOWN BELOW
PIN 14
PIN 13
FOR TA/RA OPERATION PINS 13 AND 14 OF U401 ARE ACTIVE PIN 13 AND 14 ARE ACTIVE DURING RECEIVE
+7.5V REF
N C
EEPS-29166-D
U401 IS A LINEAR INTEGRATED CIRCUIT THAT IS DEDICATED TO ENCODE AND DECODE OPERATIONS. DETECTED AUDIO FROM THE RADIO RECEIVER IS APPLIED TO U401. U401 PROVIDES AN AUDIO ENABLE OUTPUT WHEN THE PROPER TONE IS DECODED. U401 ALSO GENERATES THE PROPER "PRIVATE - LINE" CODE FOR THE TRANSMIT MODE. CODING INFORMATION FOR U401 IS PROVIDED BY THE CODE PLUG.
DETECTED OUTPUT
SQUELCH CONTROL TO PIN 10
C428 .01
PL ON/OFF
PL ON-OFF FROM HANGUP BOX VIA J601-1 NOTE 4
J4/401 NOTE 4
C424 .05
NOTE 7
MONITOR
HANG-UP BOX GROUND VIA J601-2
SWITCH (CHASSIS MOUNTED) MAXAR AND MAXAR 80 ONLY
OPT
ON
S602
OPTIONAL REMOTE MONITOR VIA J601-1
R423 10K
CODE PLUG SELECT
DEL PTT OUT
DELAYED PTT TO PIN 9
DELAYED PTT IS LOW DURING PTT AND FOR 180 MS AFTER RELEASE OF PTT
R422 1K
R421 100K
R407 1.2K
C407 220PF
C440 0.22
R420 2.2K
R424 24K
C441 .018
R432 SETS ENCODED TONE LEVELS
TONE DISABLE (PAGING BASE STATION MODELS ONLY)
Q406 M9642
R433 25K
C411 0.22
R406 10K
BRN-ORG
PL TONE OUTPUT TO PIN 8
C412 .0056
C409 .047
C410 220PF
TONE DISABLE PADS NOTE 6
Q406 AND ASSOCIATED CIRCUIT MAKE UP THE ENCODE LOW PASS FILTER AND AMPLIFIER
NOTES
1. UNLESS OTHERWISE NOTED: ALL CAPACITOR VALUES ARE GIVEN IN MICROFARADS. RESISTOR VALUES IN OHMS. VOLTAGES ARE DC.
2. PIN DESIGNATIONS SUCH AS PIN 8 IDENTIFY CONNECTIONS THAT ARE LOCATED ON THE MAIN RADIO CHASSIS.
3. PIN DESIGNATIONS SUCH AS J4/401 IDENTIFY CONNECTIONS THAT ARE LOCATED ON THE PL CIRCUIT BOARD.
4. J4/401 IS IN IF HANG UP BOX OR BASE STATION MICROPHONE IS NOT USED.
5. CODE PLUG IN J402 SETS CODE FOR TRANSMIT AND RECEIVE MODES DURING TA/RA OPERATION.
6. SHORT ACROSS TONE DISABLE PLATING TO DISABLE TRANSMIT TONE WHILE SETTING TRANSMITTER FREQUENCY.
7. THE J4/401 PIN IS USED WITH BASE STATION DESK MICROPHONE ONLY.
8. ALL DC VOLTAGES MEASURED WITH MOTOROLA 5180 DC MULTIMETER (11 MEGOHM INPUT IMPEDANCE) OR EQUIVALENT.
9. ALL AC VOLTAGES ARE RMS VALUES.

REEDLESS TONE *PRIVATE-LINE* ENCODER/DECODER

Motorola No. PEPS-31303-C
(Sheet 1 of 2)
11/15/82-PHI

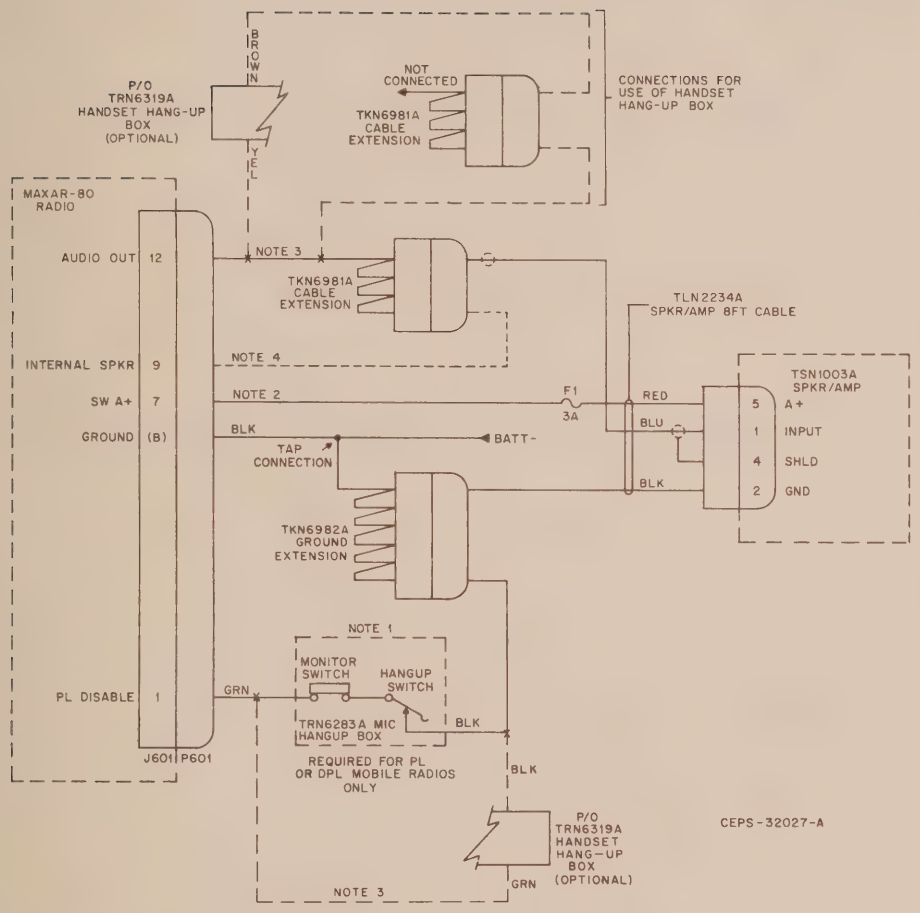
parts list

TRN4237A Reedless Tone *Private-Line* Encoder/Decoder PL-6778-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 500 V: unless otherwise stated
C401, 402	21-83596E36	.01 + 60-40%; 250 V
C403	23-84665F02	15 + 100-10%; 25 V
C404	21-83596E10	220 pF ± 20%
C405	21-851299	600 pF
C406	23-84762H06	1 ± 20%; 35 V
C407, 408	21-83596E10	220 pF ± 20%
C409	8-84637L31	.047; 250 V
C410	21-83596E10	220 pF ± 20%
C411	8-84637L22	0.22; 100 V
C412	8-83813H26	.0056 ± 5%; 50 V
C413	21-83596E10	220 pF ± 20%
C414	23-82783B13	15 ± 5%; 25 V
C415	21-83596E36	.01 + 60-40%; 250 V
C416, 417, 418	8-84637L42	0.47; 100 V
C419	8-84637L22	0.22; 100 V
C420, 421	8-84637L36	.082 ± 5%; 100 V
C422	21-82073F01	800 pF
C423	21-82428B34	600 pF
C424	21-82372C10	.05; ± 20%; 25 V
C425	21-82187B16	.003; 100 V
C426	23-84665F02	15 + 100-10%; 25 V
C427	21-82372C10	.05 ± 20%; 25 V
C428	21-83596E36	.01 + 60-40%; 250 V
C429, 431	21-83596E10	220 pF ± 20%
C440	8-84637L22	0.22; 100 V
C441	8-84637L28	.018; 250 V
C450	8-82905G03	.047 ± 5%; 50 V
C451	8-83813H23	.068 ± 5%; 50 V
C454	23-84665F02	15 + 100-10%; 25 V
C455	8-82095G16	.056 ± 5%; 200 V
C456	8-84637L18	0.12 ± 5%; 100 V
		diode: (see note)
CR401	48-83654H01	silicon
		connector, receptacle:
J401, 402	9-82071K01	female, socket; 13 contact
J404	9-84881F03	female; socket; 40-contact
		coil, rf:
L401	25-82498H02	choke; 6 H, 10%
		transistor: (see note)
Q401	48-869648	NPN; type M9648
Q404, 406	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R401	6-124A35	270
R404,405	6-124C89	47k ± 10%
R406	6-124C79	18k ± 10%
R407	6-10621C03	1.2k ± 1%; 1/8 W
R408	6-10621D66	59k ± 1%; 1/8 W
R409	6-124A85	33k
R410	6-124B14	470k
R411	6-124B06	220k
R412	6-124A43	560
R413, 414	6-83175C68	68.1k ± 1%
R415	6-124B02	150k
R416	6-124A43	560
R417	6-124A96	91k
R418	6-124B02	150k
R419	6-124A99	120k
R420	6-10621C40	2.9k ± 1%; 1/8 W
R421	6-124C97	100k ± 10%
R422	6-124C49	1k ± 10%
R423	6-124C73	10k ± 10%
R424	6-124A82	24k
R433	18-84944C02	variable, 25k
R451	6-124A66	5.1k
R452	6-124A67	5.6k
R453	6-124A85	33k
R454	6-124A93	68k
R456	6-124A35	270
		integrated circuit: (see note)
U401	51-83977M17	type M7717
		voltage regulator: (see note)
VR401	48-82256C38	Zener type: 9.1 V
VR403	48-82256C44	Zener type: 7.5 V
		crystal:
Y401	48-80055C01	32.768 kHz
		mechanical parts
	42-10217A02	STRAP, tie (WHT): 3 used
	29-82713M01	TERMINAL, BRS; 14 used
	39-10184A24	CONTACT, receptacle: 11 used
	29-84706E06	TERMINAL, crimp socket; 2 used

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

TSN1003A SPEAKER/AMPLIFIER CONNECTION DIAGRAM FOR *MAXAR-80* L.P.I. RADIO SETS



NOTES

1. 4 FREQ. MODELS USE TRN6284A MIC HANG-UP BOX WITH MONITOR SWITCH
2. A MAXIMUM OF 4 SPKR/AMP UNITS CAN BE DRIVEN FROM ONE RADIO. HOWEVER, ADDITIONAL TKN6981A EXTENDER CABLES WILL BE REQUIRED FOR SW A+ AND AUDIO FEED.
3. IF A HANDSET HANG-UP UNIT (TRN6319A) IS USED, CONNECT AS SHOWN IN ITS INSTRUCTION MANUAL EXCEPT FOR THE FOLLOWING CHANGES
   - A. CONNECT BROWN WIRE (SPKR INTERRUPT TO DISTRIBUTION PIN OF AN ADDITIONAL TKN6981A CABLE EXTENSION AS NOTED IN THIS SCHEMATIC DIAGRAM.
   - B. CONNECT INPUT WIRE OF EXISTING TKN6981A CABLE EXTENSION TO A DISTRIBUTION PIN OF THE ADDED EXTENSION CABLE
4. ON MODELS WITH INTERNAL RADIO SPEAKER, JUMPER P601 (9) TO (12) IS TO BE REMOVED FROM P601-12 AND CONNECTED TO CABLE EXTENDER. ON MODELS WITHOUT INTERNAL SPEAKER JUMPER P601 (9) TO (12) SHOULD BE REMOVED COMPLETELY AND EXTERNAL SPEAKER CONNECTED AS SHOWN.

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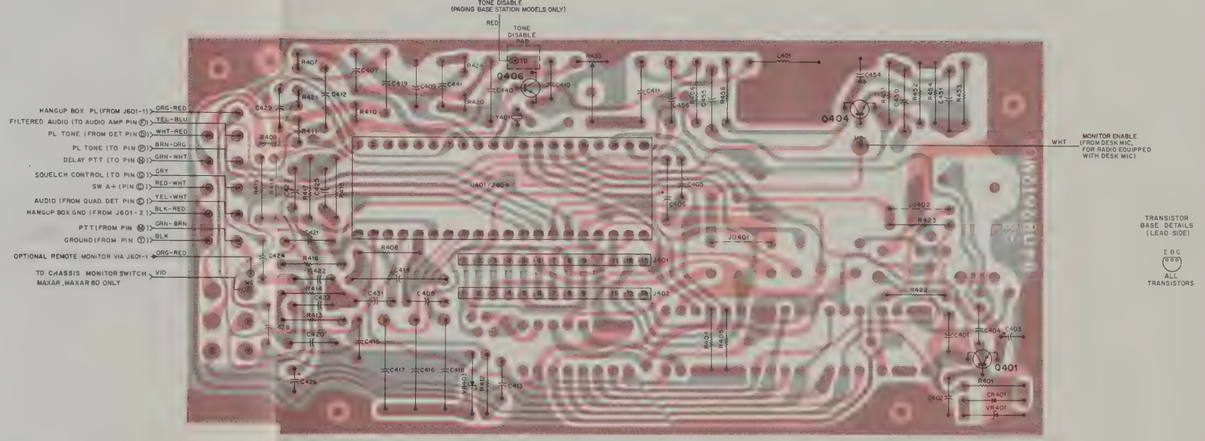
REEDLESS TONE *PRIVATE-LINE* SQUELCH ENCODER/DECODER

MODEL TRN4237A



SHOWN FROM SOLDER SIDE

SOLDER SIDE : 80-DEPS-29164-A
COMPONENT SIDE : 80-DEPS-29165-O
OL-DEPS-29163-C

parts list

TRN4237A Reedless Tone *Private-Line* Encoder/Decoder PL-6778-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed: uF ± 10%; 500 V: unless otherwise stated
C401, 402	21-83596E36	.01 + 80-40%; 250 V
C403	23-84665F02	15 + 100-10%; 25 V
C404	21-83596E10	220 pF ± 20%
C405	21-851299	600 pF
C406	23-84762H06	1 ± 20%; 35 V
C407, 408	21-83596E10	220 pF ± 20%
C409	8-84637L31	.047; 250 V
C410	21-83596E10	220 pF ± 20%
C411	8-84637L22	0.22; 100 V
C412	8-83813H26	.0056 ± 5%; 50 V
C413	21-83596E10	220 pF ± 20%
C414	23-82783B13	15 ± 5%; 25 V
C415	21-83596E36	.01 + 80-40%; 250 V
C416, 417, 418	8-84637L42	0.47; 100 V
C419	8-84637L22	0.22; 100 V
C420, 421	8-84637L36	.082 ± 5%; 100 V
C422	21-82073F01	900 pF
C423	21-82428B34	600 pF
C424	21-82372C10	.05; ± 20%; 25 V
C425	21-82187B16	.003; 100 V
C426	23-84665F02	15 + 100-10%; 25 V
C427	21-82372C10	.05 ± 20%; 25 V
C428	21-83596E36	.01 + 80-40%; 250 V
C429, 431	21-83596E10	220 pF ± 20%
C440	8-84637L22	0.22; 100 V
C441	8-84637L28	.018; 250 V
C450	8-82905G03	.047 ± 5%; 50 V
C451	8-83813H23	.068 ± 5%; 50 V
C454	23-84665F02	15 + 100-10%; 25 V
C455	8-82095G16	.056 ± 5%; 200 V
C456	8-84637L18	0.12 ± 5%; 100 V
		diode: (see note)
CR401	48-83654H01	silicon
		connector, receptacle:
J401, 402	9-82071K01	female; socket; 13 contact
J404	9-84881F03	female; socket; 40-contact
		coil, rf:
L401	25-82498H02	choke; 6 H, 10%
		transistor: (see note)
Q401	48-869648	NPN; type M9648
Q404, 406	48-869642	NPN; type M9642
		resistor, fixed: ± 5%; 1/4 W: unless otherwise stated
R401	6-124A35	270
R404, 405	6-124C89	47k ± 10%
R406	6-124C79	18k ± 10%
R407	6-10621C03	1.2k ± 1%; 1/8 W
R408	6-10621D66	59k ± 1%; 1/8 W
R409	6-124A85	33k
R410	6-124B14	470k
R411	6-124B06	220k
R412	6-124A43	560
R413, 414	6-83175C68	68.1k ± 1%
R415	6-124B02	150k
R416	6-124A43	560
R417	6-124A96	91k
R418	6-124B02	150k
R419	6-124A99	120k
R420	6-10621C40	2.9k ± 1%; 1/8 W
R421	6-124C97	100k ± 10%
R422	6-124C49	1k ± 10%
R423	6-124C73	10k ± 10%
R424	6-124A82	24k
R433	18-84944C02	variable; 25k
R451	6-124A66	5.1k
R452	6-124A67	5.6k
R453	6-124A85	33k
R454	6-124A93	68k
R456	6-124A35	270
		integrated circuit: (see note)
U401	51-83977M17	type M7717
		voltage regulator: (see note)
VR401	48-82256C38	Zener type; 9.1 V
VR403	48-82256C44	Zener type; 7.5 V
		crystal:
Y401	48-80055C01	32.768 kHz
		mechanical parts
	42-10217A02	STRAP, tie (WHT); 3 used
	29-82713M01	TERMINAL, BRS; 14 used
	39-10184A24	CONTACT, receptacle; 11 used
	29-84706E06	TERMINAL, crimp socket; 2 used

note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

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USER QUESTIONNAIRE

To the User of This Instruction Manual:

Motorola is engaged in a continuous program of improving its instruction literature. We believe that you can aid us in this program, so that we in turn can better help you service our equipment. To foster these aims, would you please answer the following questions:

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AVAILABLE BACKGROUND REFERENCE PUBLICATIONS

Seven reference publications are available to provide background information needed to service some of the newer Motorola products more effectively. The information in these publications is not duplicated in our instruction manuals. To obtain your free copy, check the ones you want and return this self-mailer to us.

Check item desired:

☐ **Basic Logic Circuit Guide** 68P81105E88
Describes the basic logic circuits used in Motorola Communications digital equipment and the logic notational scheme used in our instruction manuals.

☐ **"Digital Private-Line" Binary-Coded Squelch** 68P81106E83
Contains fundamentals of "Digital Private-Line" system operation, circuit operation and servicing techniques.

☐ **Safe Handling of CMOS Integrated Circuit Devices** 68P81106E84
Describes special handling techniques needed to prevent irrepairable damage from static charges encountered with normal handling of CMOS devices.

☐ **Reducing Noise Interference in Mobile Two-Way Radio Installations** 68P81109E33
Defines the major sources of noise encountered in a mobile radio installation and suggests methods of remedying them.

☐ **Anti-Skid Braking Precautions** 68P81109E34
Provides installation suggestions and a detailed checkout procedure for installation of mobile radios in vehicles with anti-skid braking systems.

☐ **Removal and Replacement of Chip Components on Circuit Boards** 68P81113E77
Contains general information and repair procedures relative to chip-type (leadless) components.

☐ **Lightning Protection Recommendations** 68P81111E17
Provides general information concerning lightning protection for equipment sites. Also, provides a quick reference of available lightning protection kits.

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